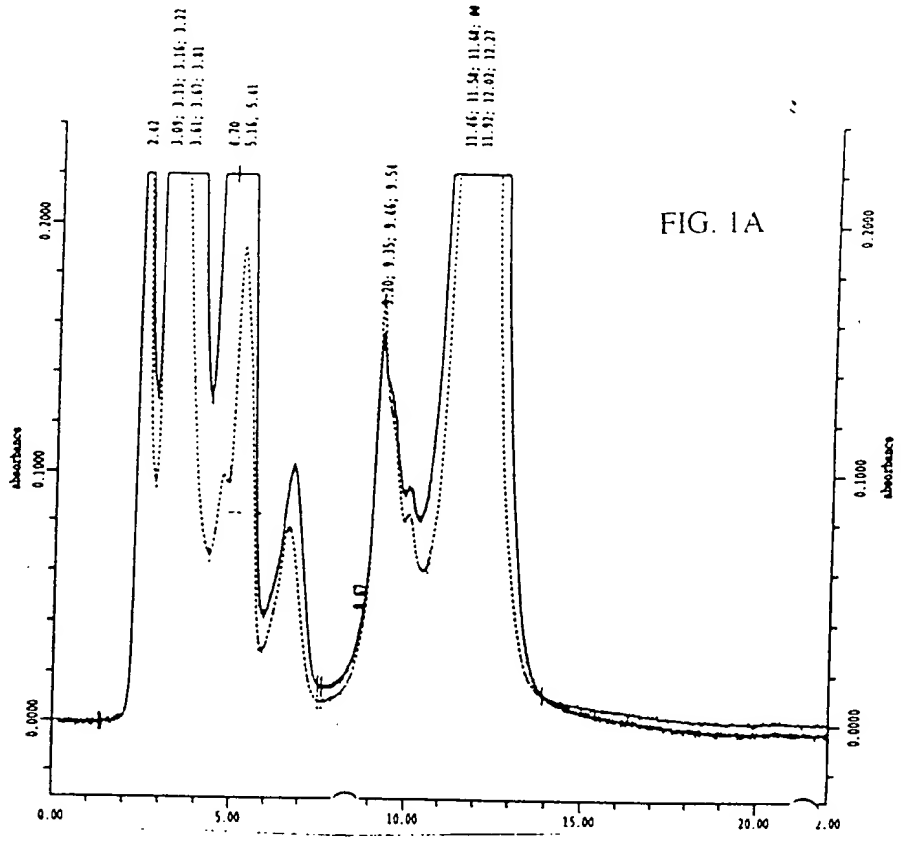


FIG. 1A

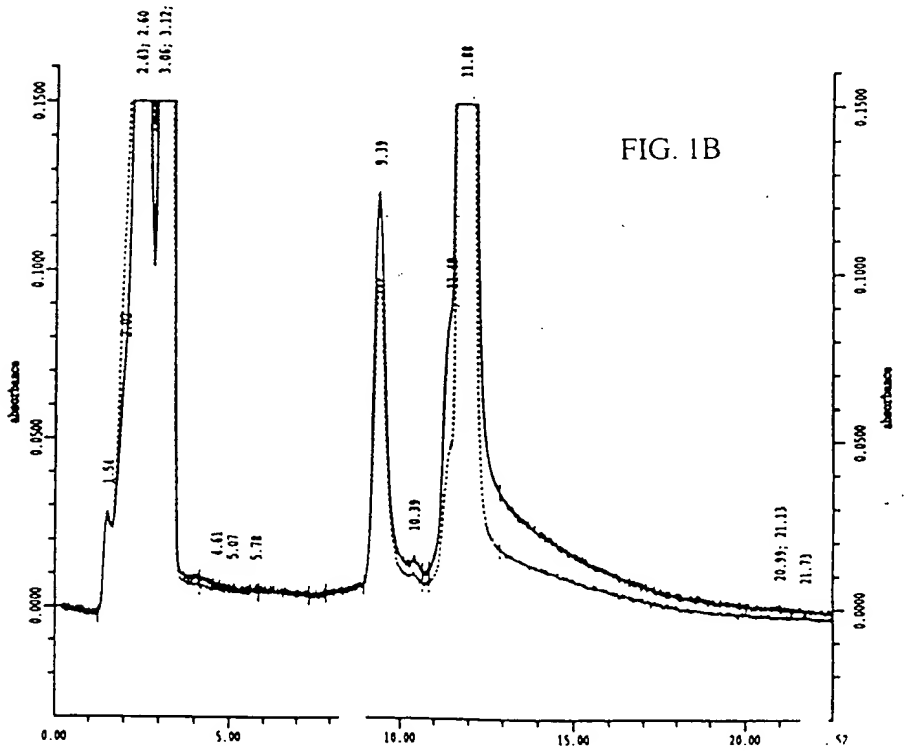


FIG. 1B

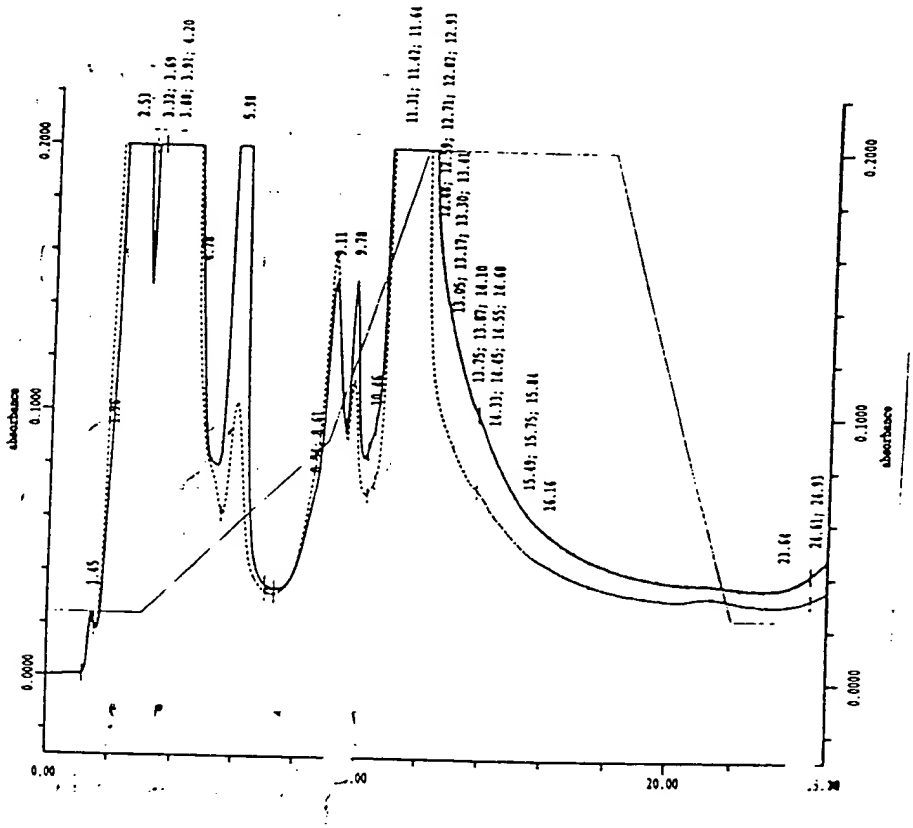

absorbance
0.2000
0.1000
0.0000
0.00
20.00
absorbance
0.2000
0.1000
0.0000

FIG. 2

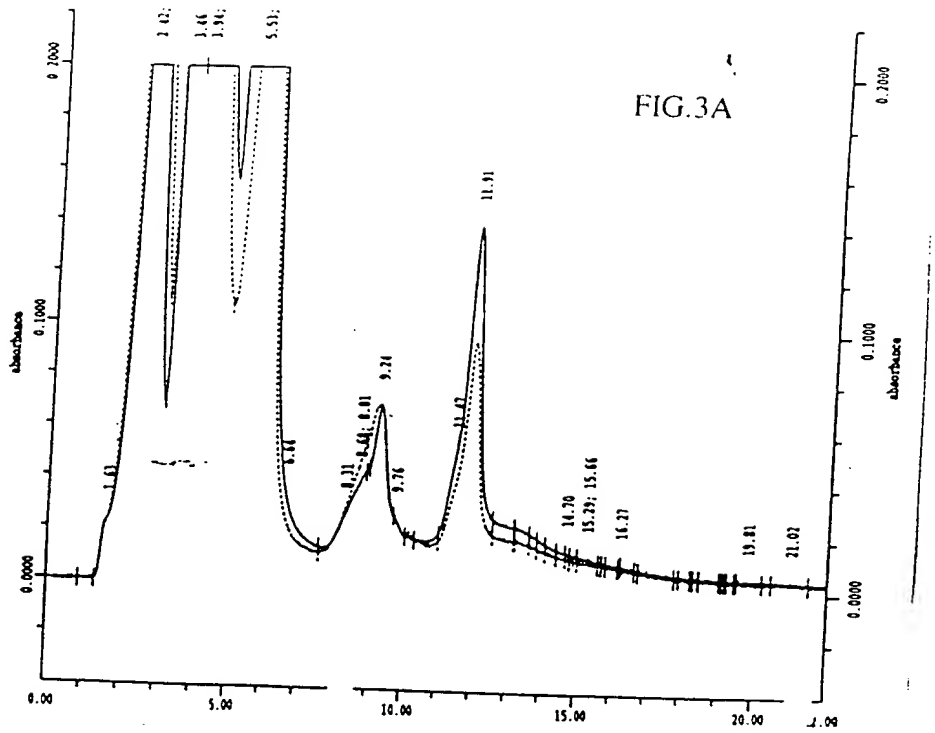


FIG.3A

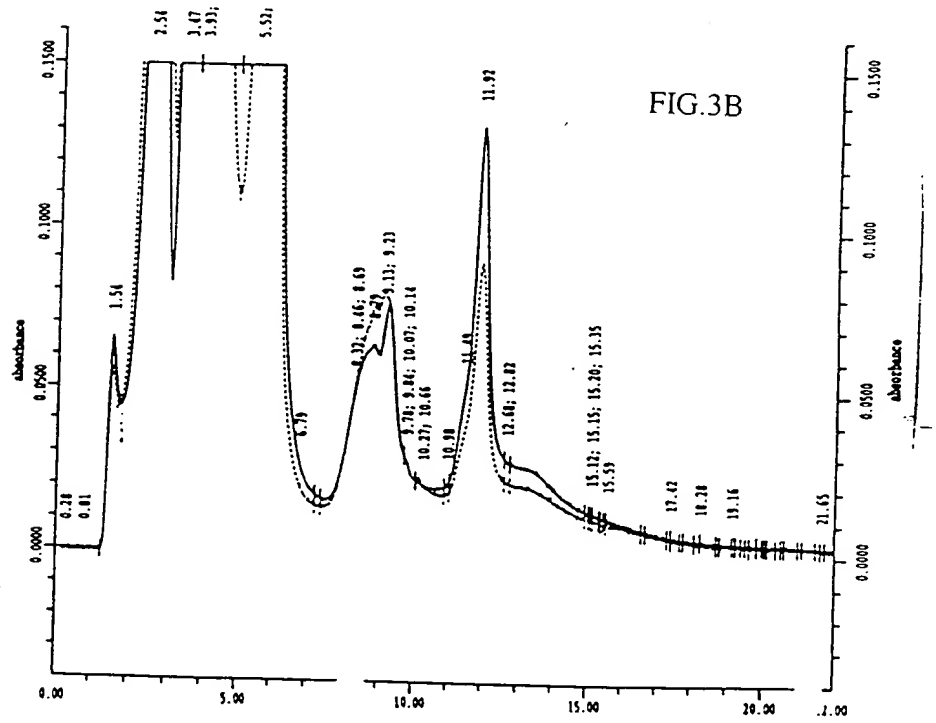


FIG.3B

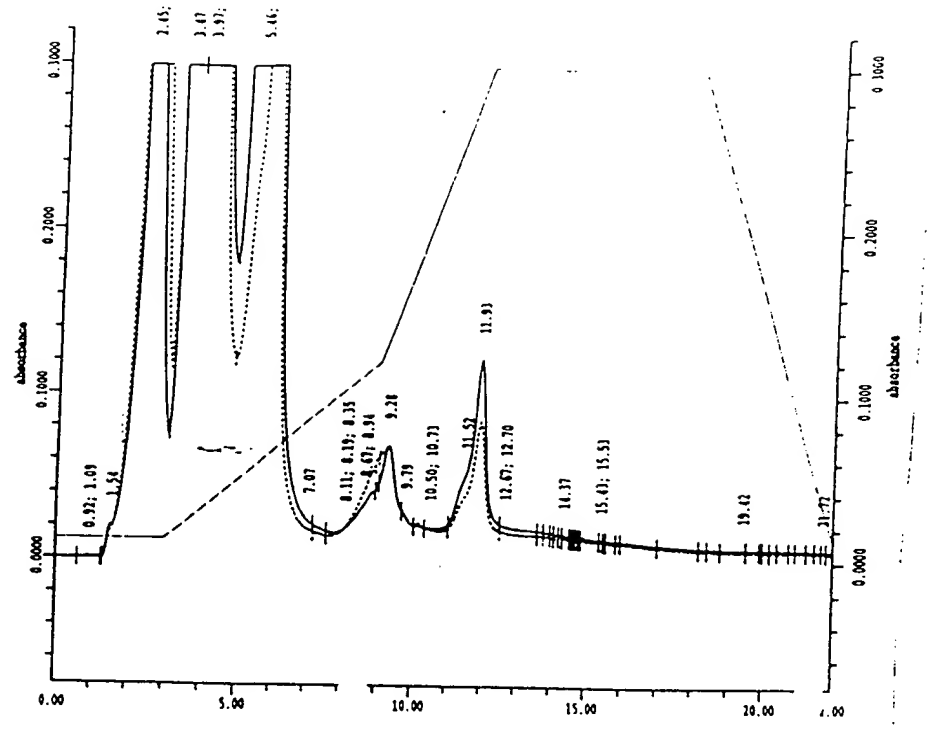

absorbance
0.3000
0.2000
0.1000
0.0000
0.00
5.00
10.00
15.00
20.00
11.93
11.52
9.28
7.07
14.37
19.42

FIG.3C

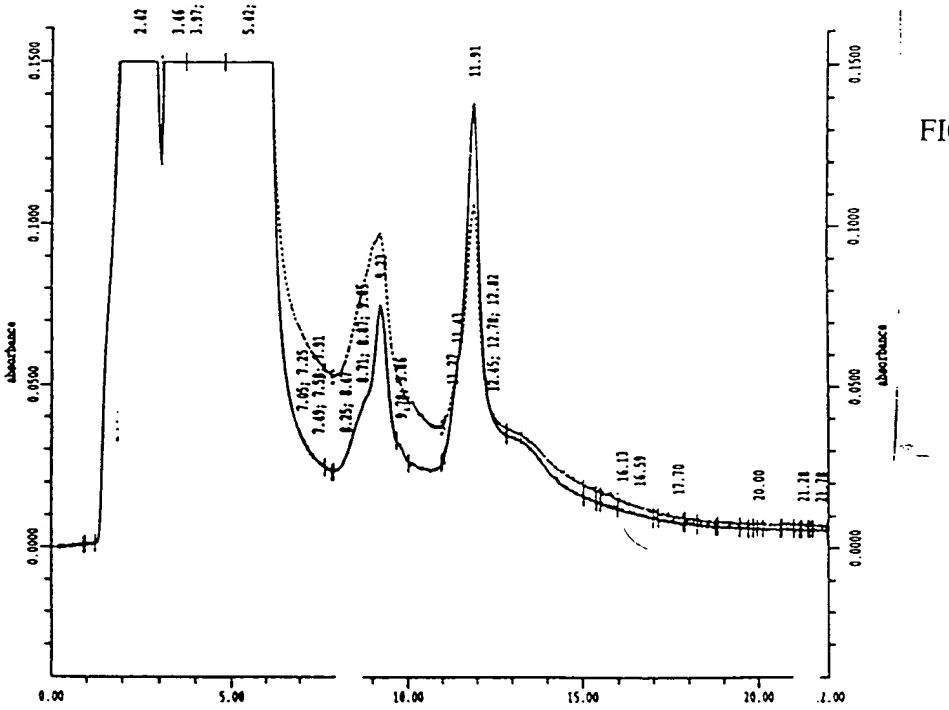

absorbance
0.1500
0.1000
0.0500
0.0000
0.00
5.00
10.00
15.00
20.00
11.91
16.13
16.59
17.70
20.00

FIG.3D

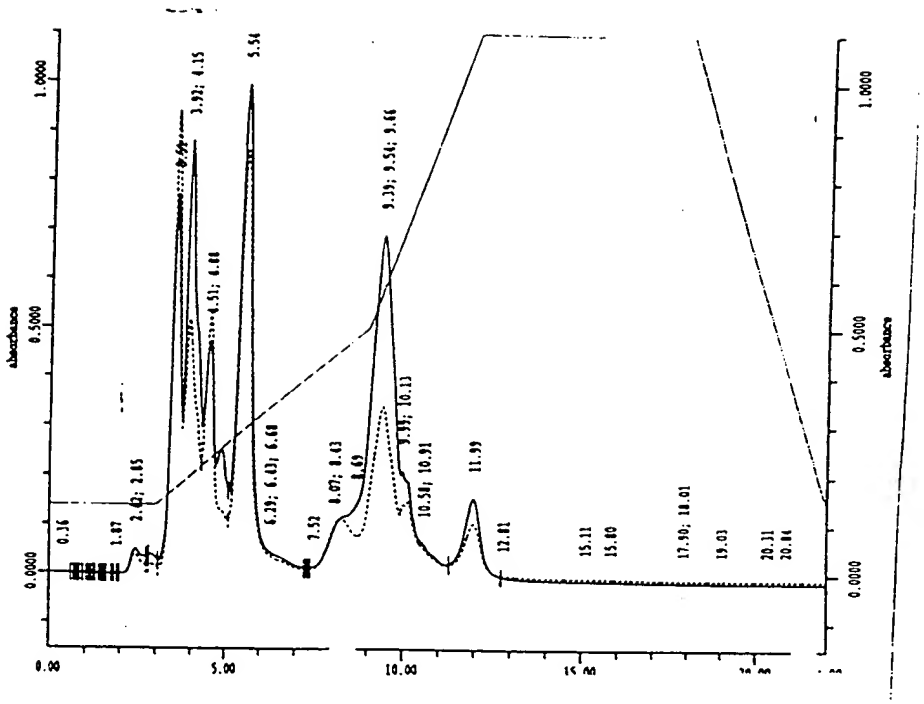

Absorbance
1.0000
0.5000
0.0000
0.00
5.00
10.00
0.36
1.87
2.42; 2.85
3.92; 4.15
4.51; 4.88
5.54
6.20; 6.43; 6.68
7.52
8.07; 8.43
8.65
9.33; 9.54; 9.66
9.95; 10.13
10.50; 10.91
11.59
12.81
15.11
15.80
17.90; 18.01
19.03
20.11
20.84

FIG.3E

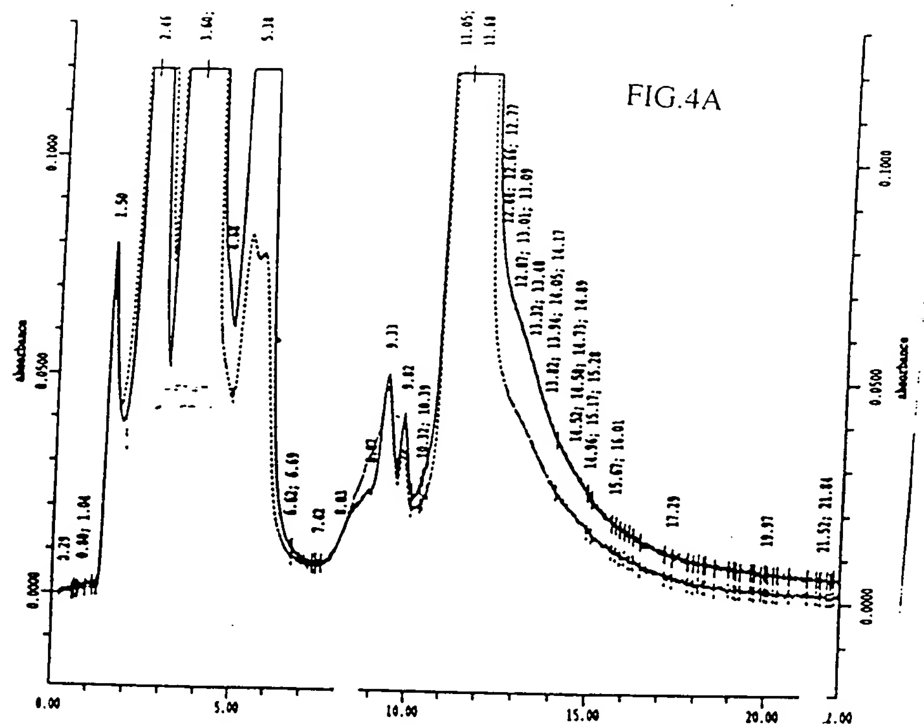


FIG.4A

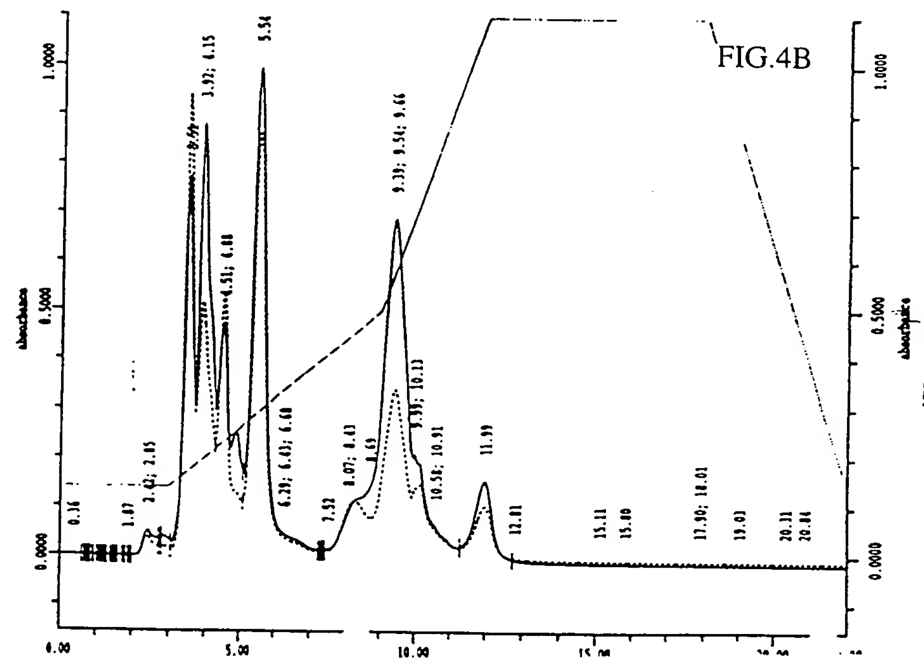


FIG.4B

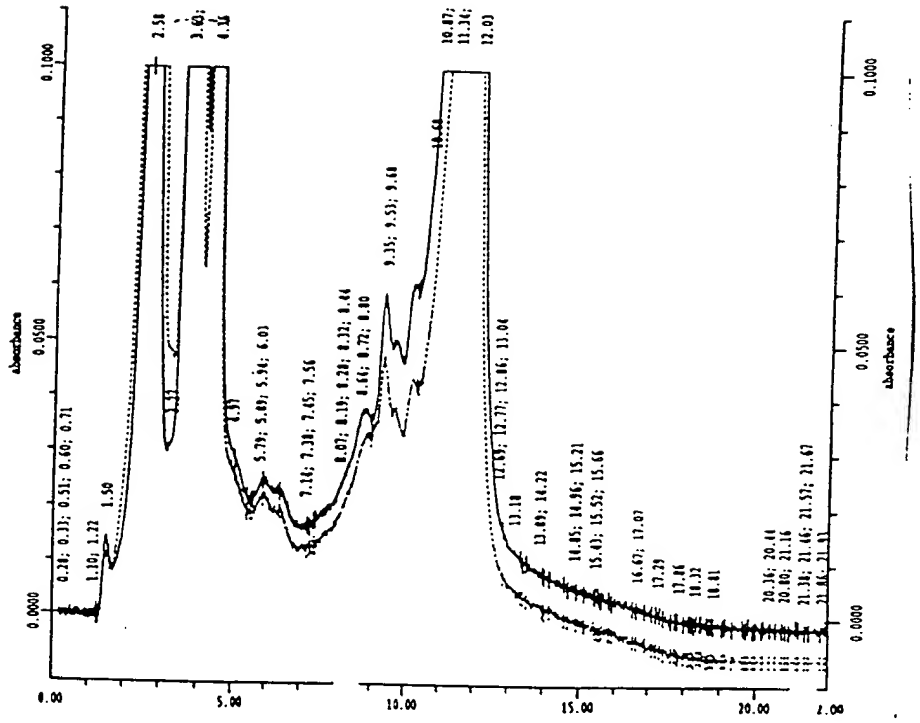


FIG.5

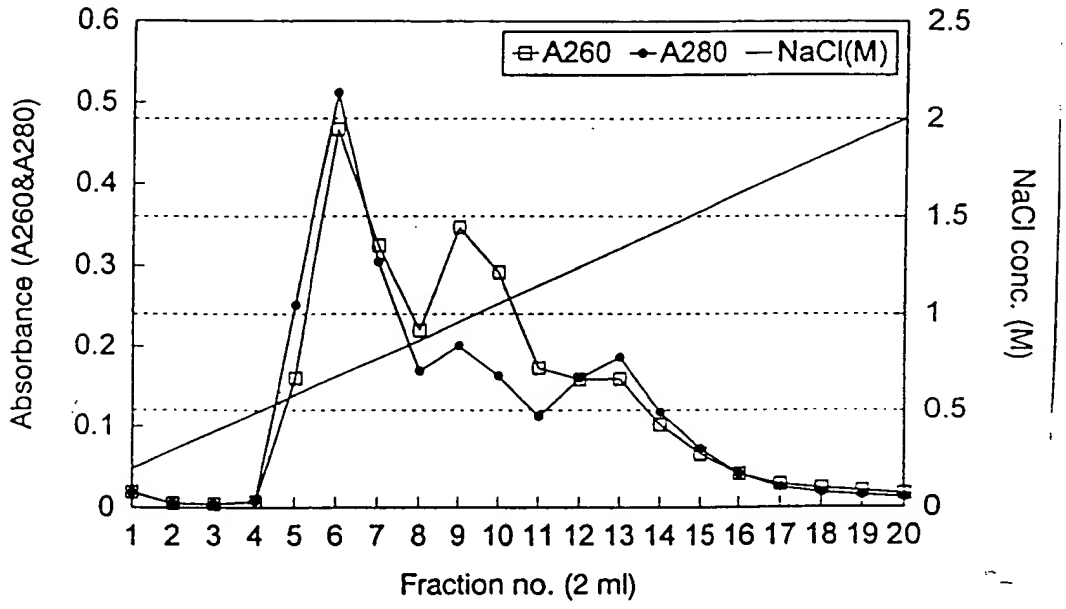

A260
A280
NaCl(M)
Absorbance (A260&A280)
NaCl conc. (M)
Fraction no. (2 ml)
0.6
0.5
0.4
0.3
0.2
0.1
0
2.5
2
1.5
1
0.5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

FIG.6

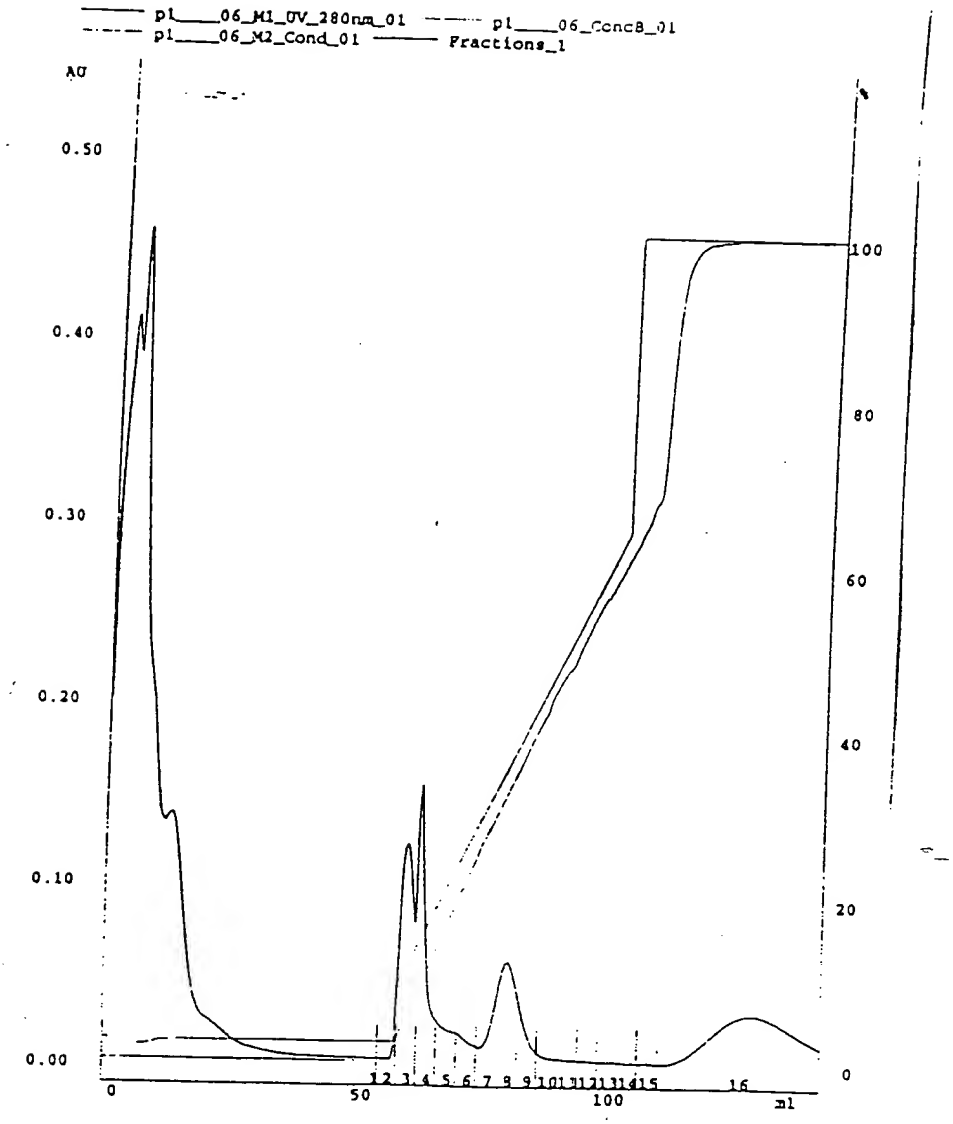

p1____06_M1_UV_280nm_01
p1____06_M2_Cond_01
p1____06_ConcB_01
Fractions_1
AU
0.50
0.40
0.30
0.20
0.10
0.00
100
80
60
40
20
0
0
50
100
ml

FIG.7

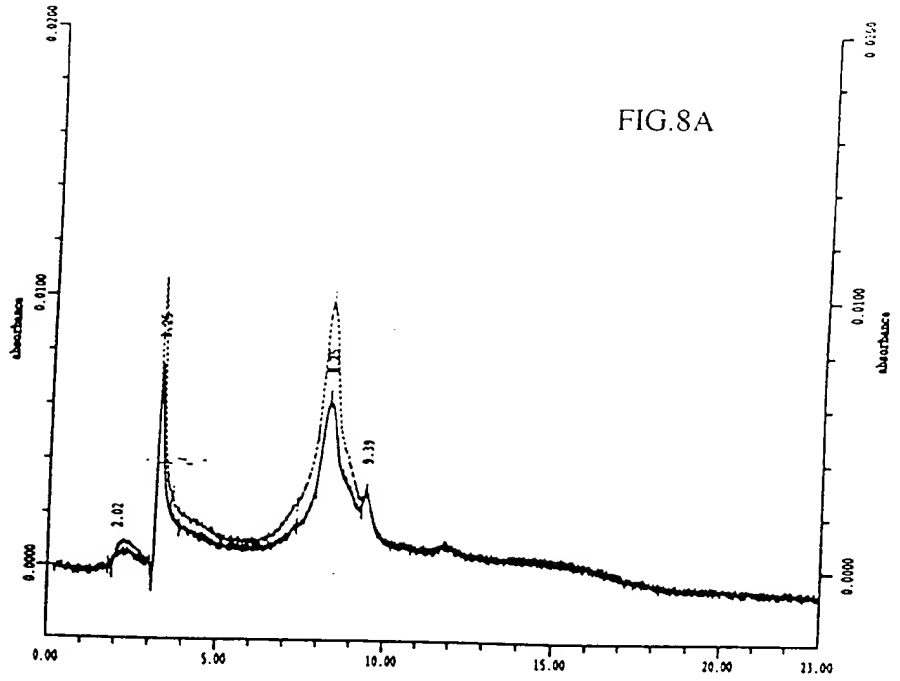

0.0200
0.0100
0.0000
Absorbance
2.02
9.38
0.00
5.00
10.00
15.00
20.00
23.00

FIG.8A

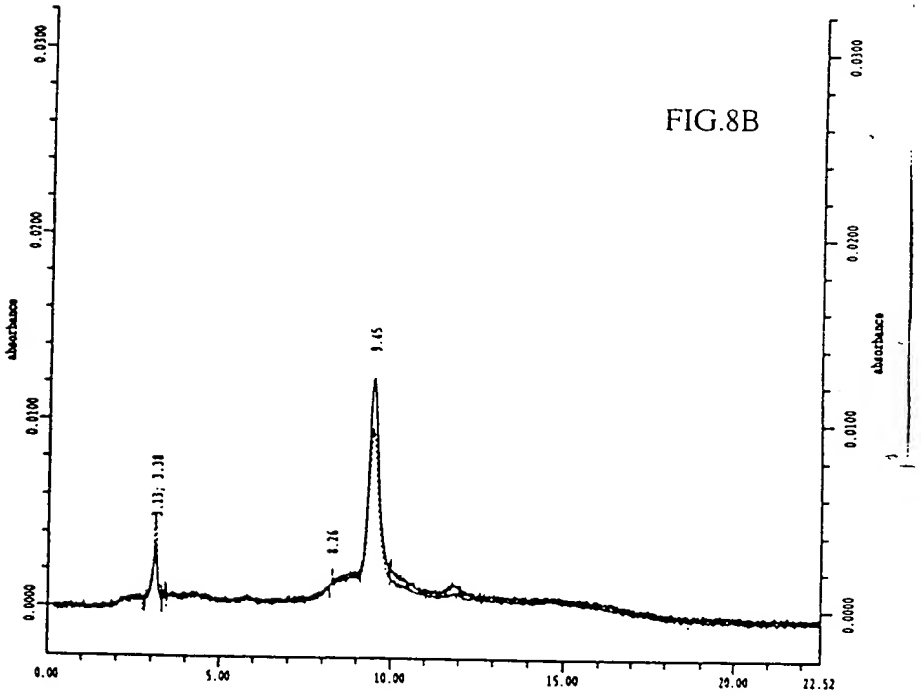

0.0300
0.0200
0.0100
0.0000
Absorbance
3.38
9.45
0.00
5.00
10.00
15.00
20.00
22.52

FIG.8B

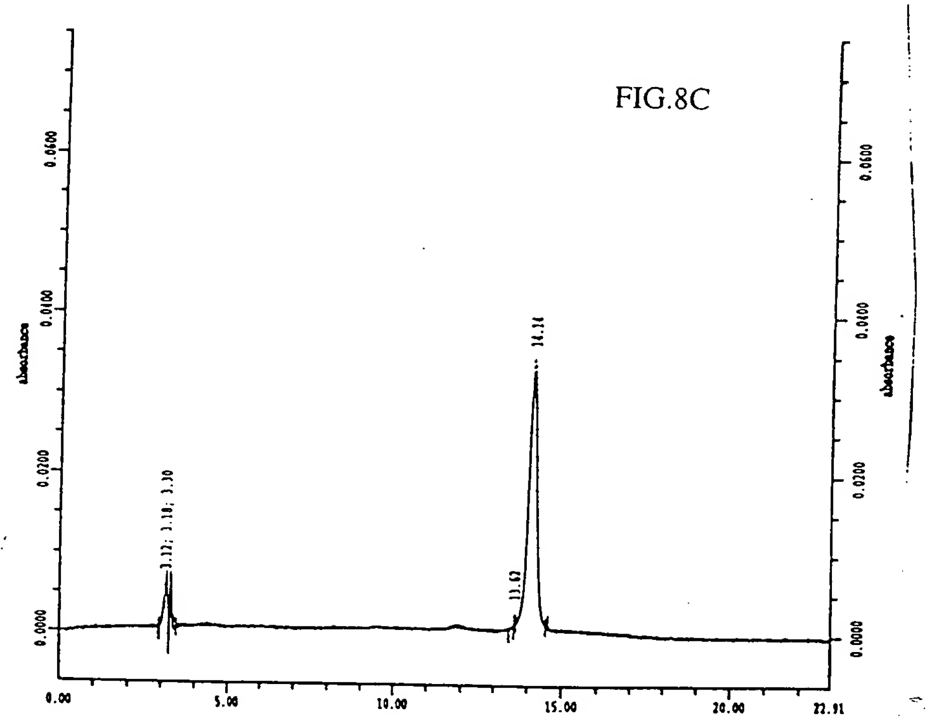

absorbance
0.0000
0.0200
0.0400
0.0600
0.00
5.00
10.00
15.00
20.00
22.91
3.12; 3.18; 3.30
13.62
14.14

FIG.8C

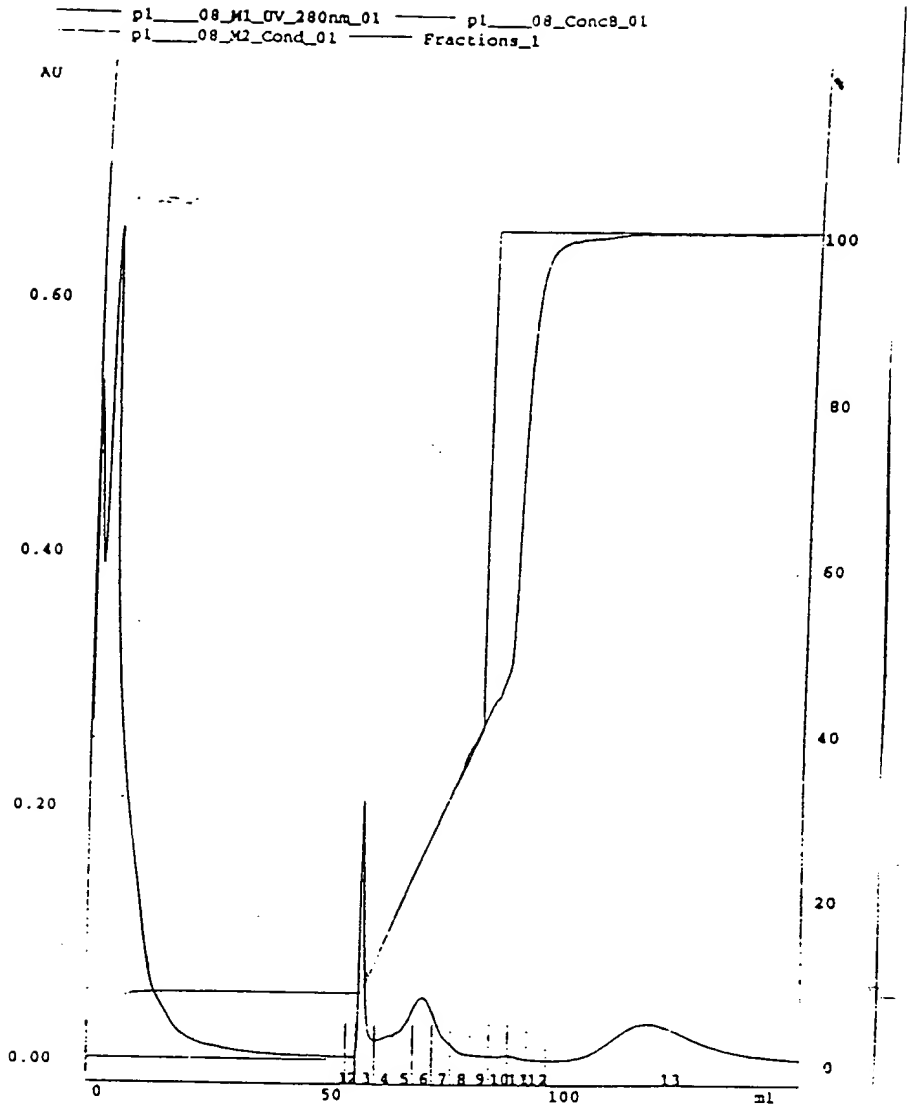

p1____08_M1_UV_280nm_01
p1____08_ConcB_01
p1____08_M2_Cond_01
Fractions_1
AU
0.60
0.40
0.20
0.00
100
80
60
40
20
0
0
50
100
ml
1 2 3 4 5 6 7 8 9 10 11 12 13

FIG. 9

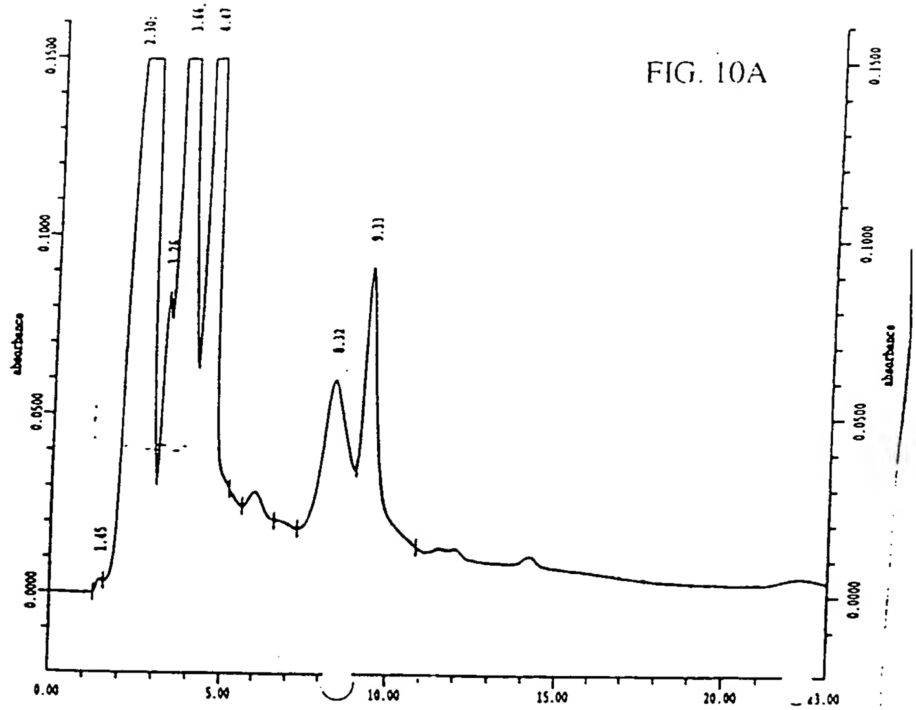


FIG. 10A

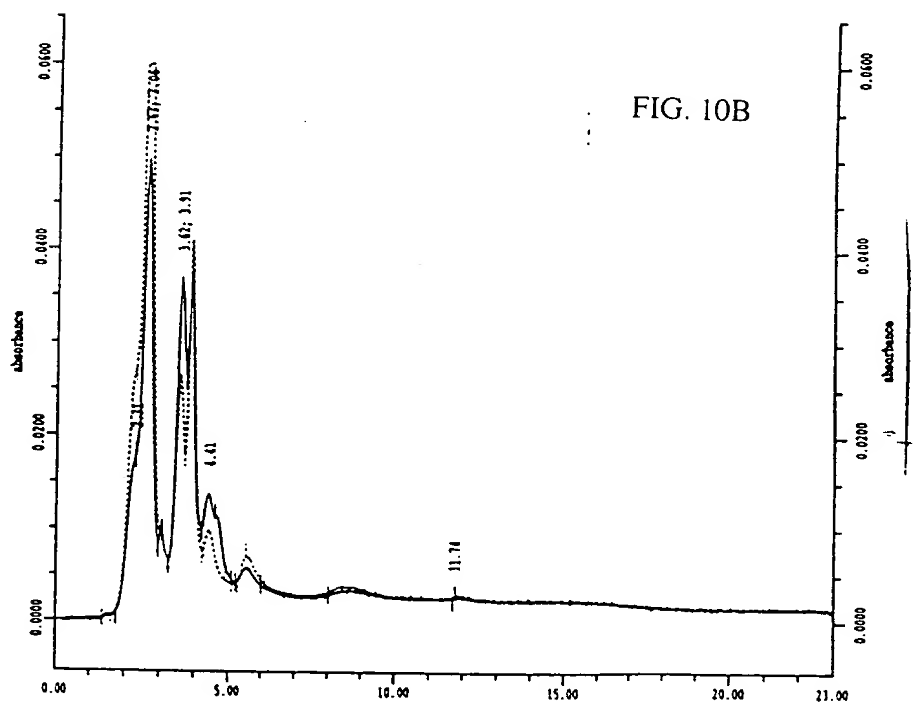


FIG. 10B

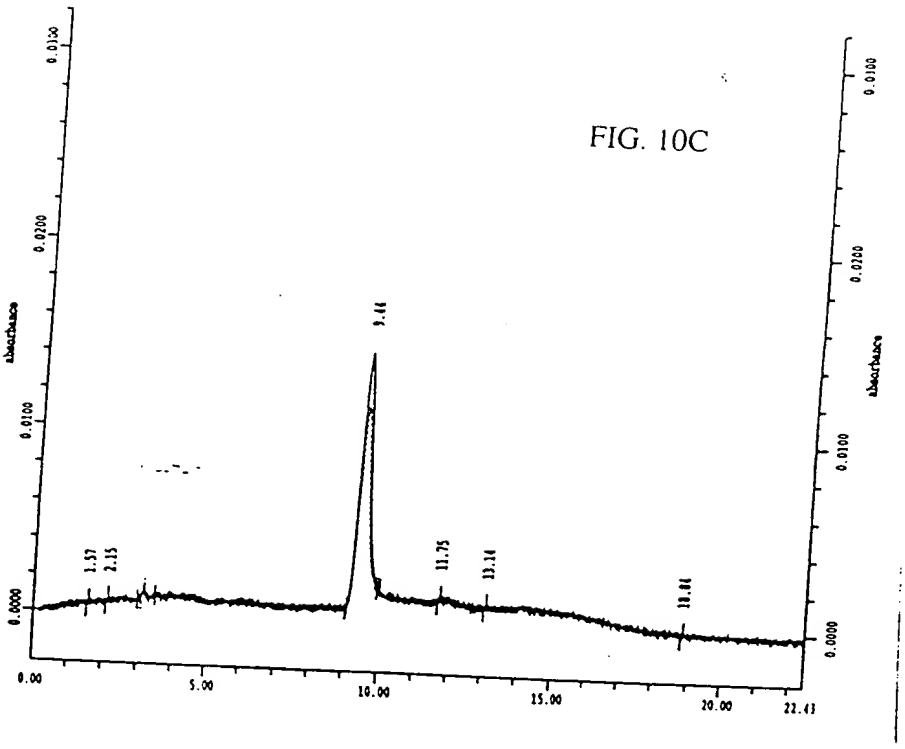


FIG. 10C

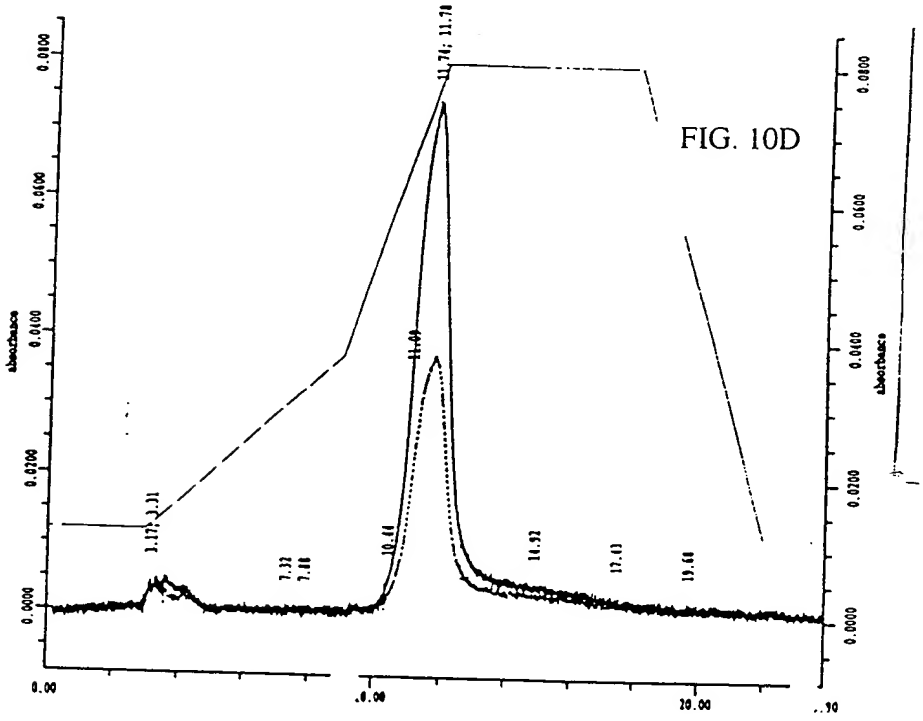


FIG. 10D

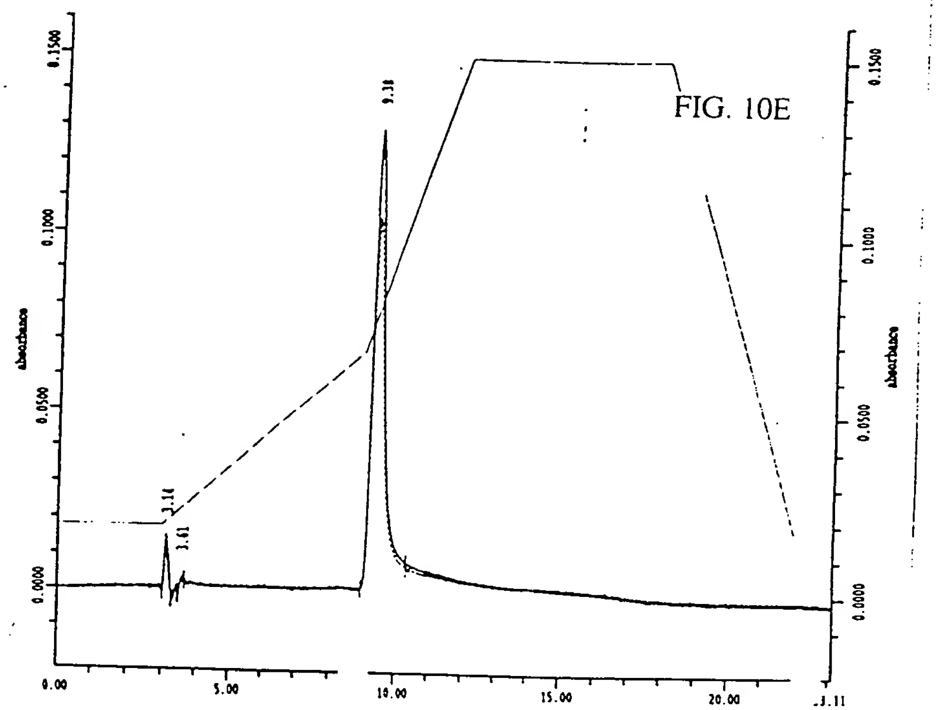


FIG. 10E

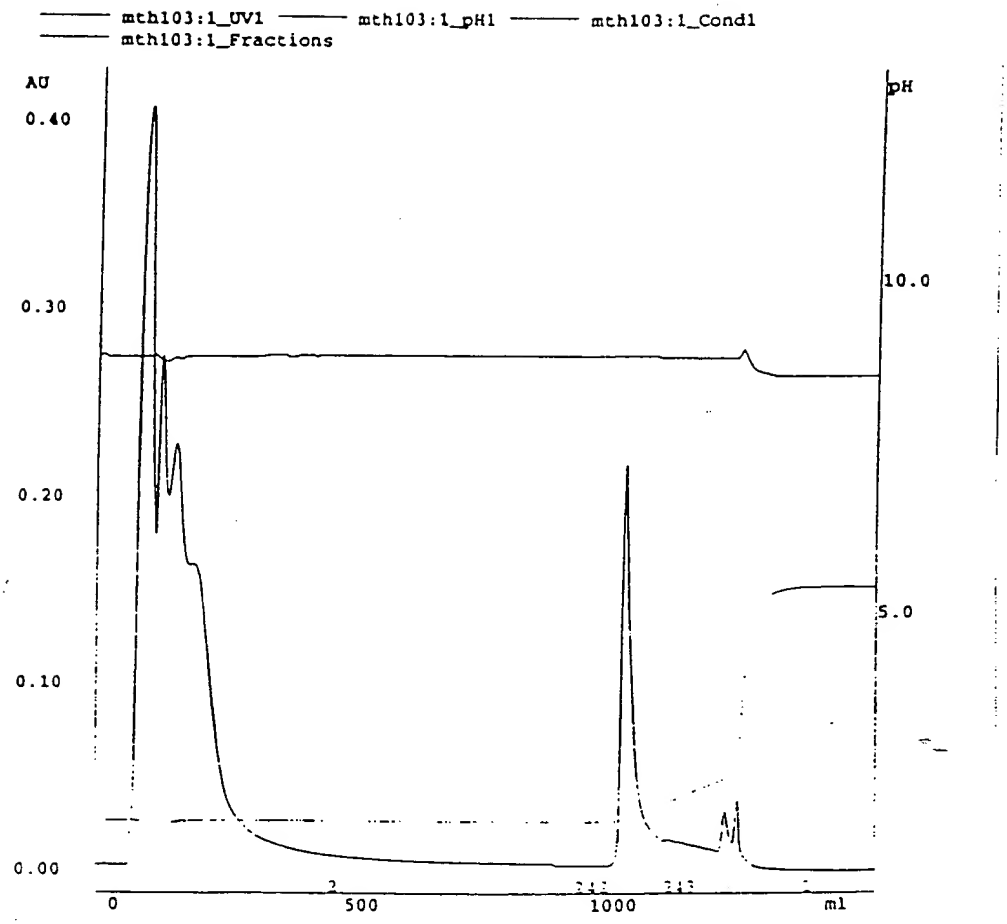

mth103:1_UV1
mth103:1_pH1
mth103:1_Cond1
mth103:1_Fractions
AU
0.40
0.30
0.20
0.10
0.00
pH
10.0
5.0
0
500
1000
ml

FIG. 11

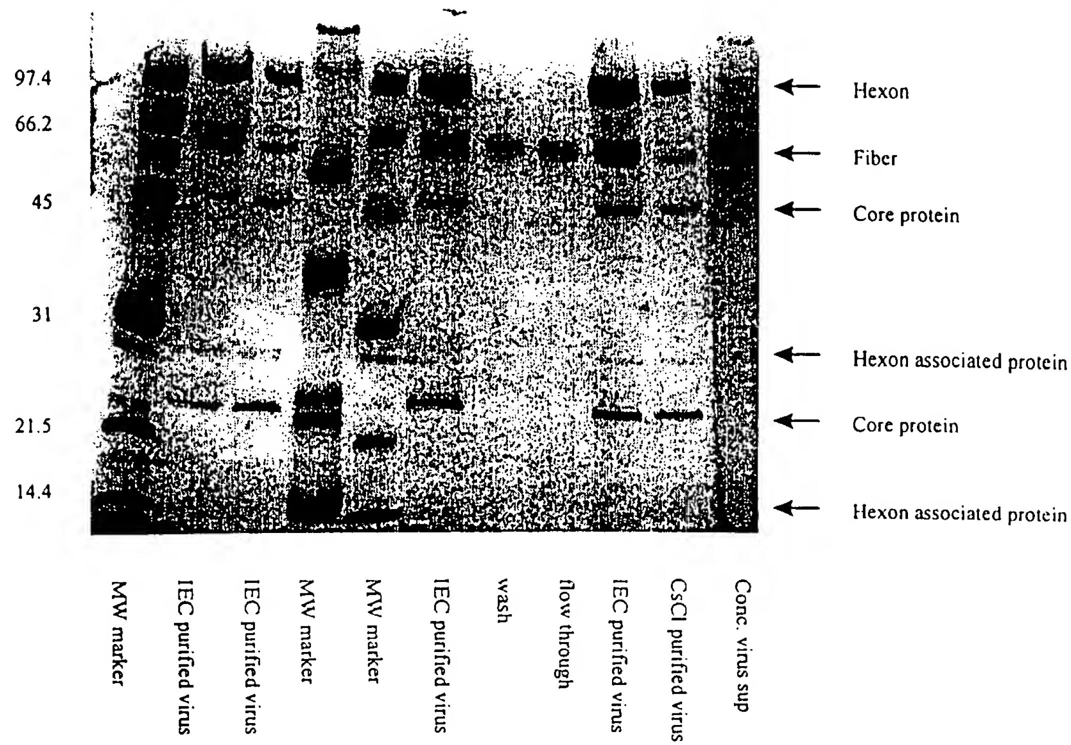


FIG. 12

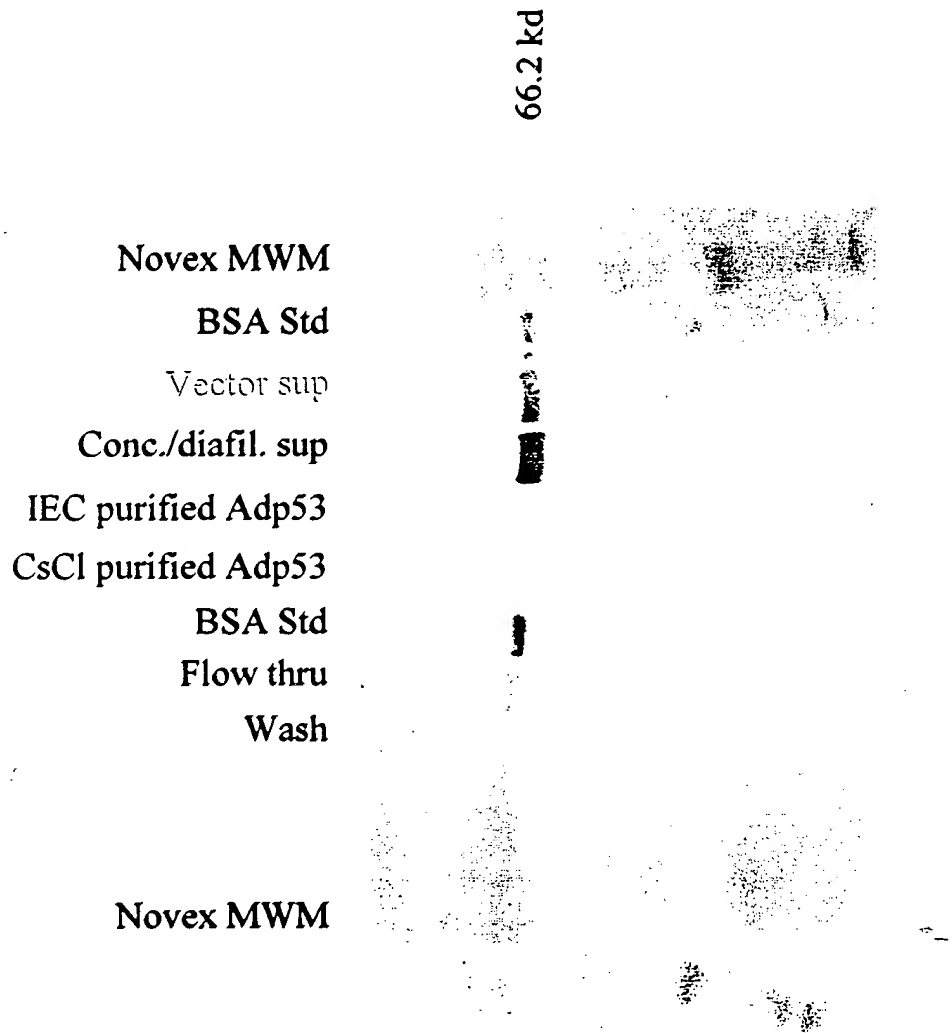


FIG. 13

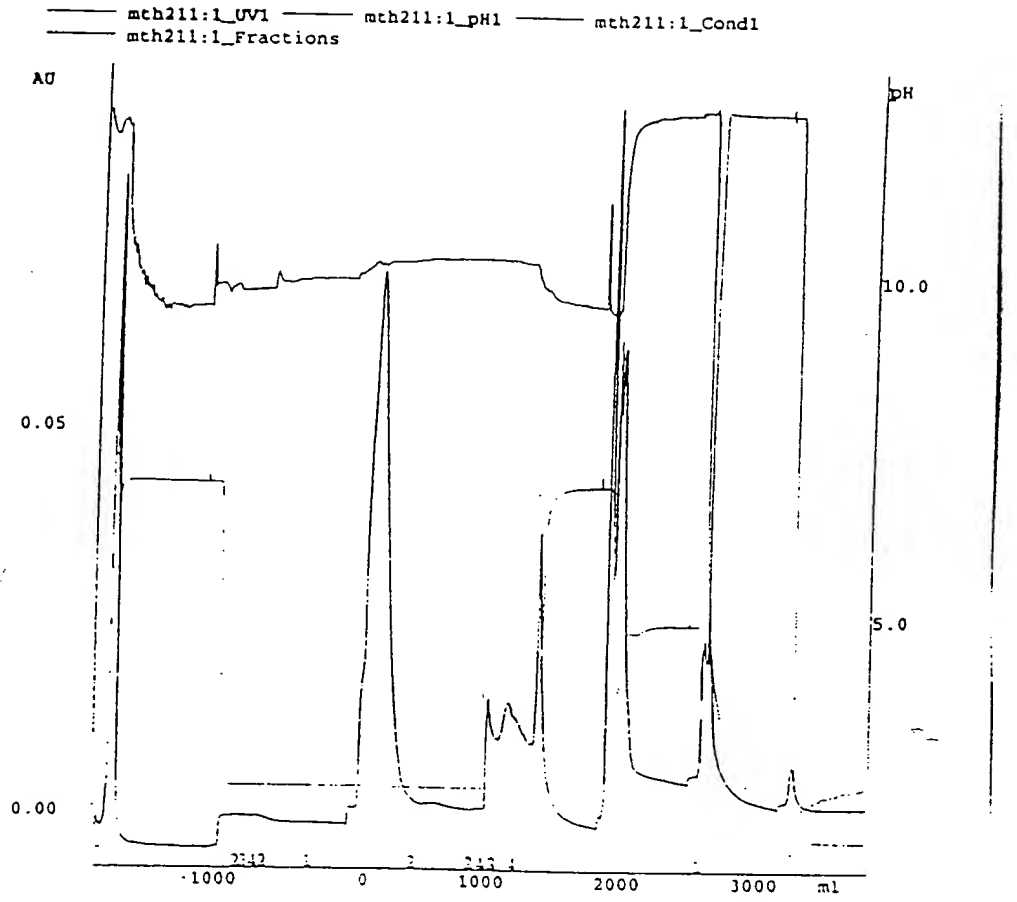

mth211:1_UV1
mth211:1_pH1
mth211:1_Cond1
mth211:1_Fractions
AU
0.05
0.00
pH
10.0
5.0
-1000
0
1000
2000
3000
ml

FIG. 14

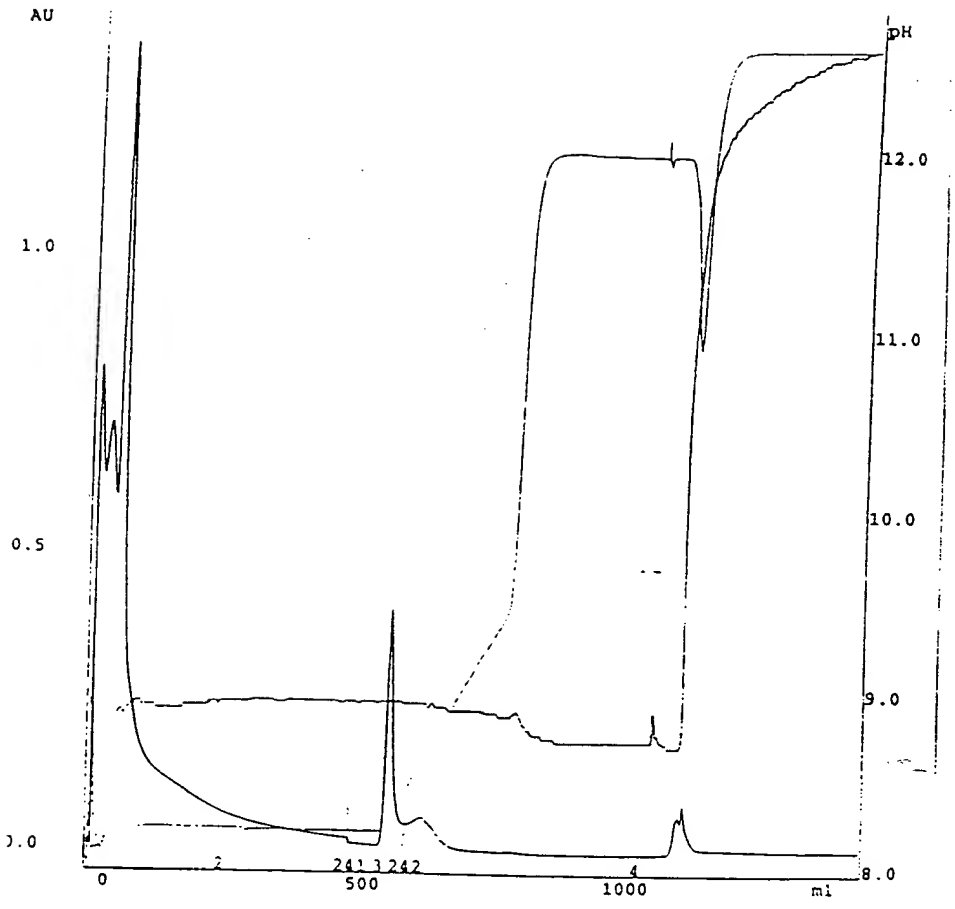


FIG. 15

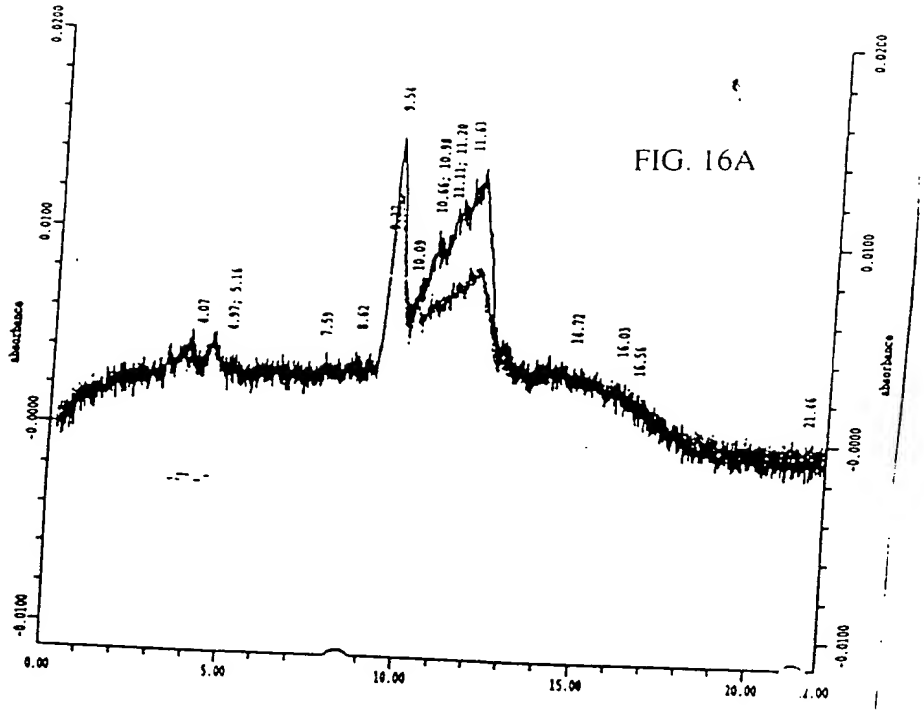


FIG. 16A

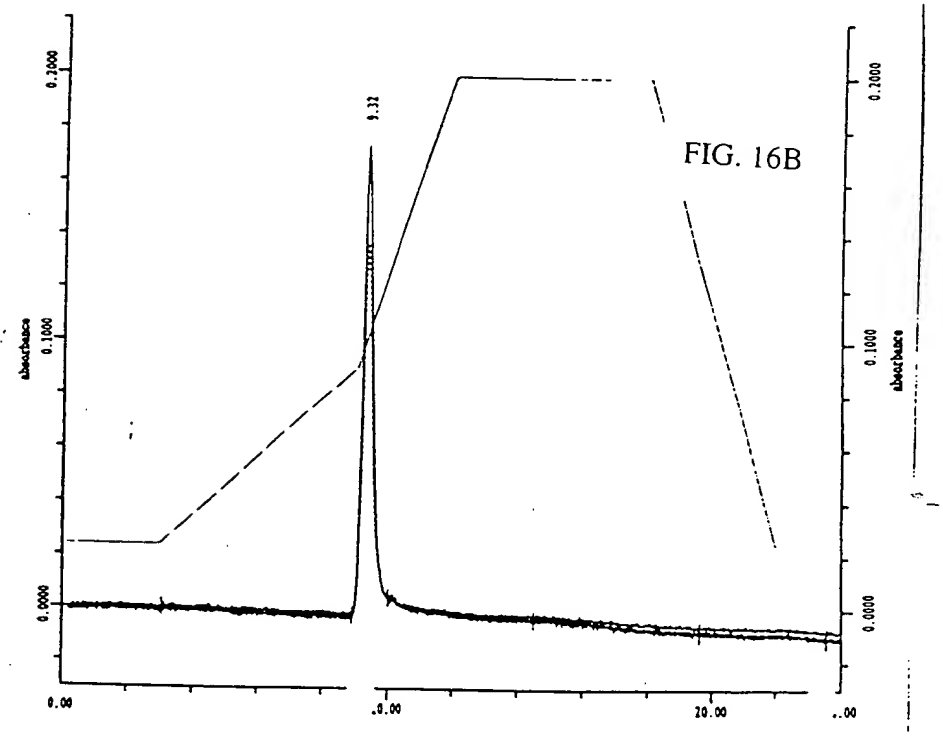


FIG. 16B

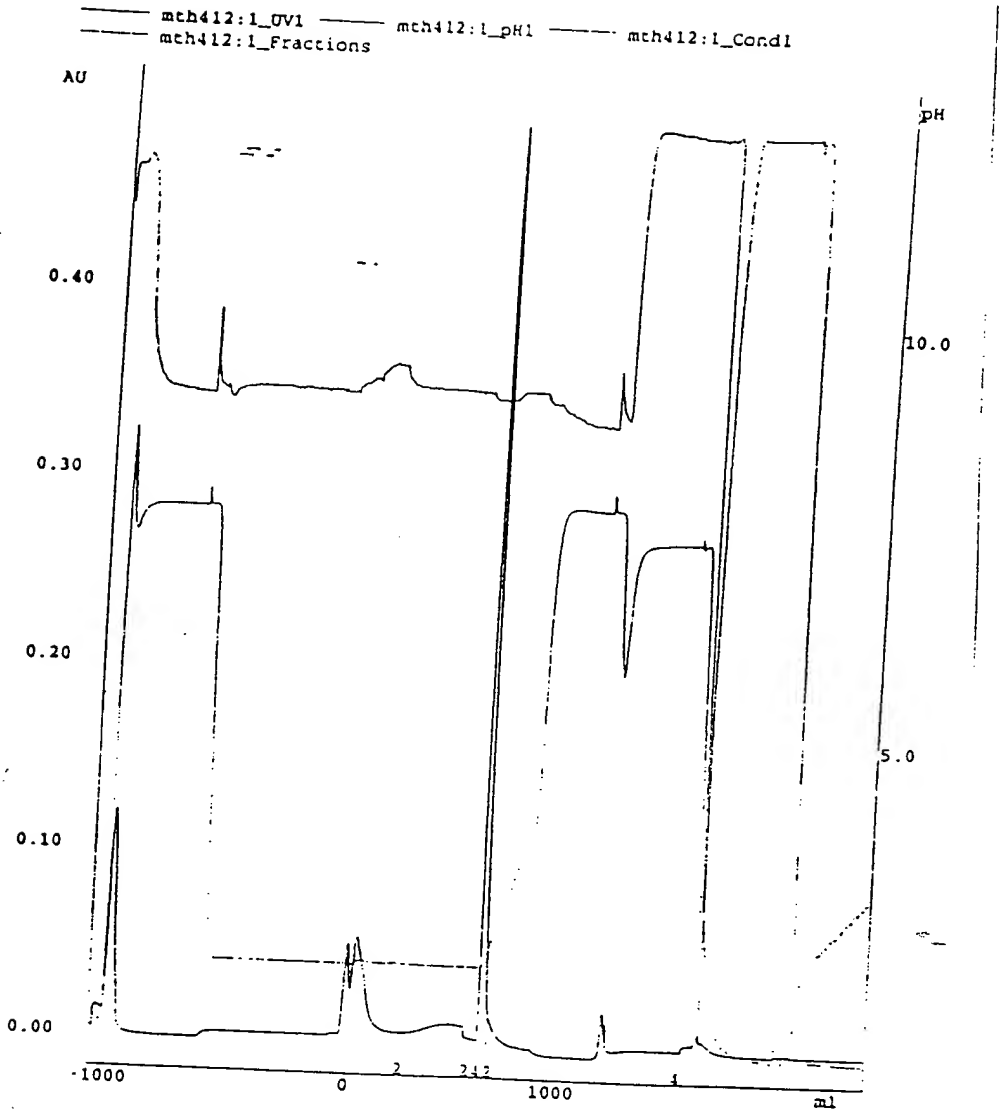

mth412:1_UV1
mth412:1_Fractions
mth412:1_pH1
mth412:1_Cond1
AU
0.40
0.30
0.20
0.10
0.00
pH
10.0
5.0
-1000
0
1000
ml

FIG. 17

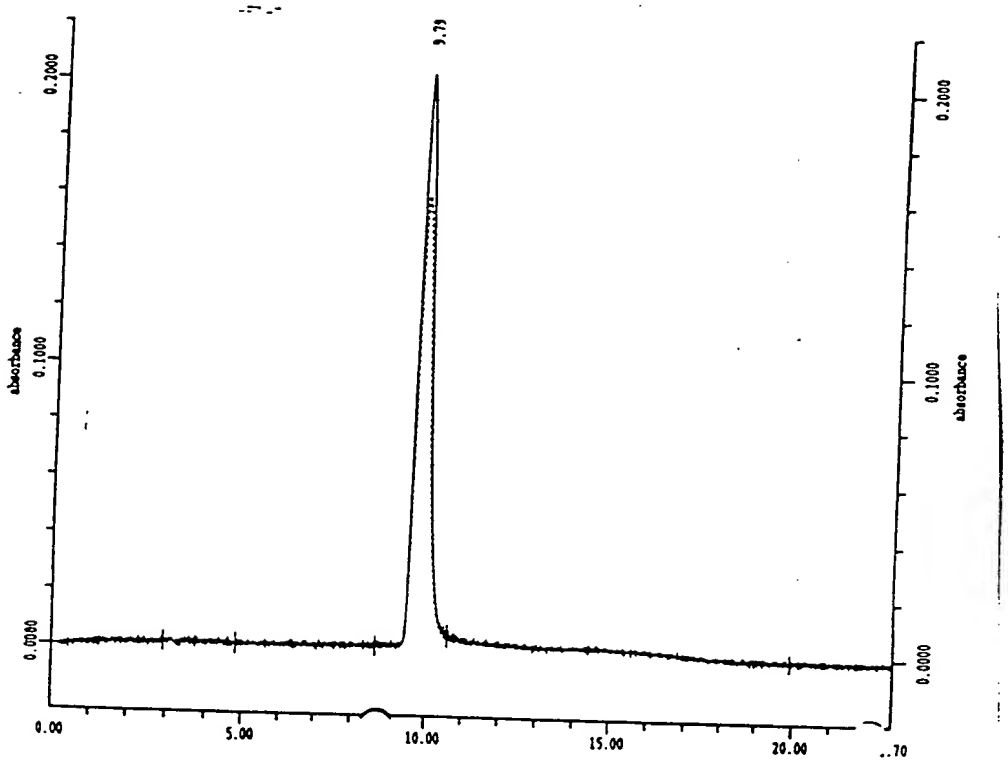
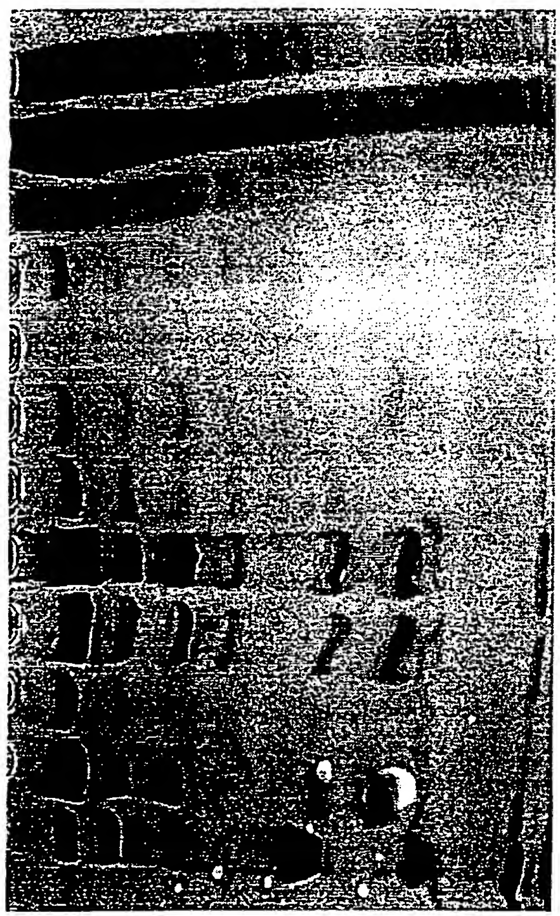


FIG. 18

FIG. 19A



Tween-20 harvest
Conc. Tween-20 harvest
Flow thru
IEC purifiedAdp53
IEC purifiedAdp53
IEC purifiedAdp53
Conc. IEC purified Adp53
Conc. IEC purified Adp53
Defective virus
CsCl purified Adp53
MWM
97
66
45
31
21.5
14

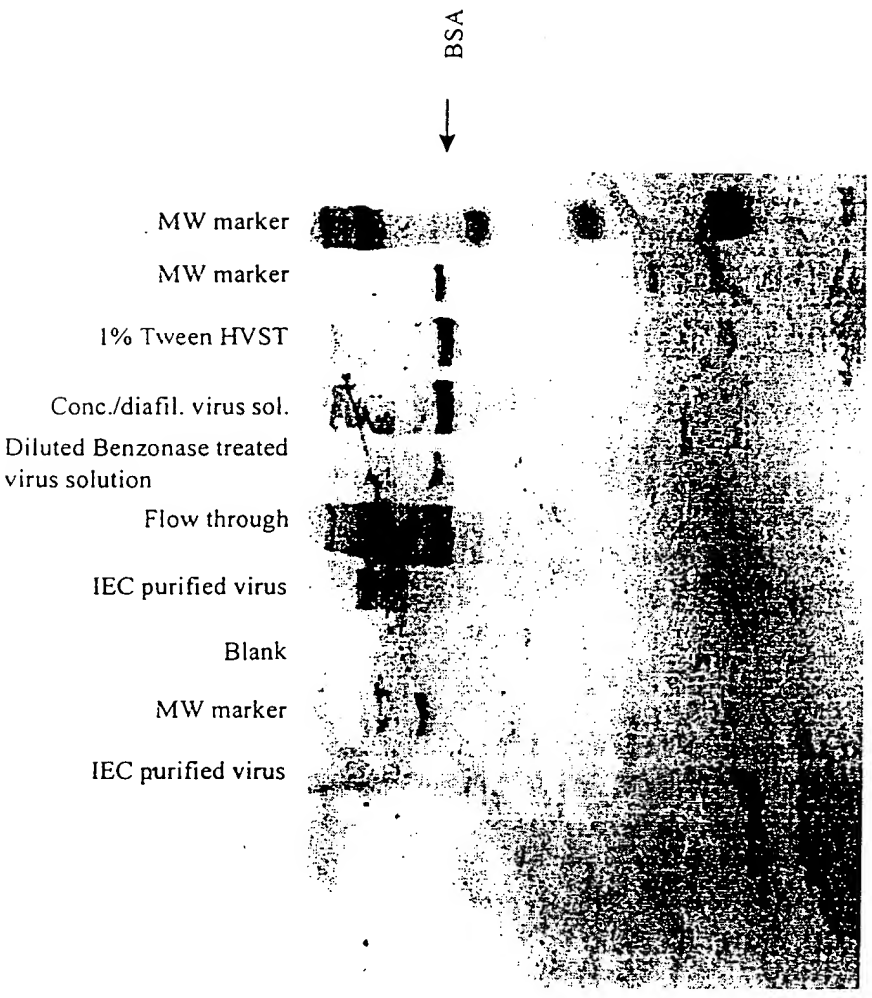


FIG. 19B

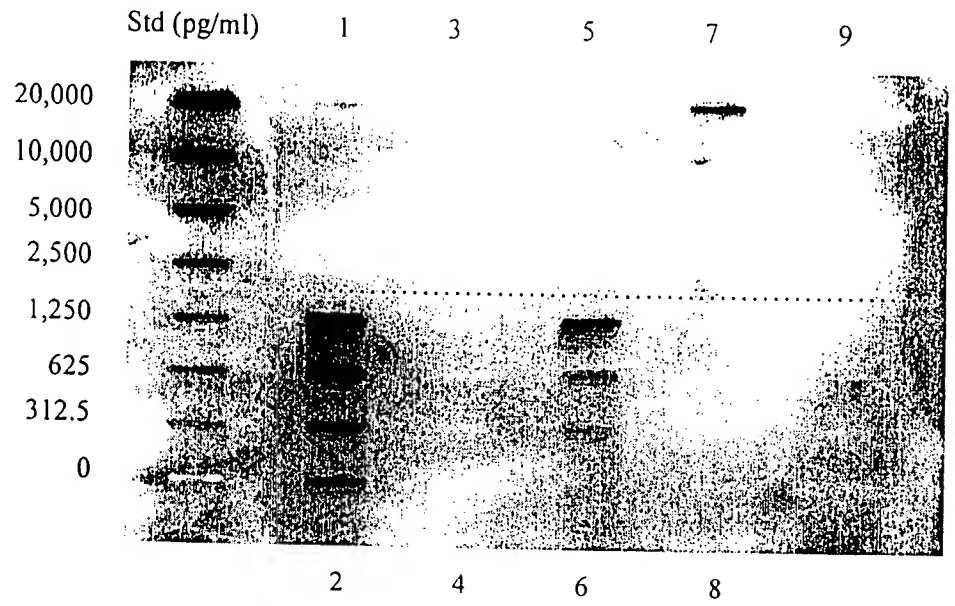


FIG. 19C

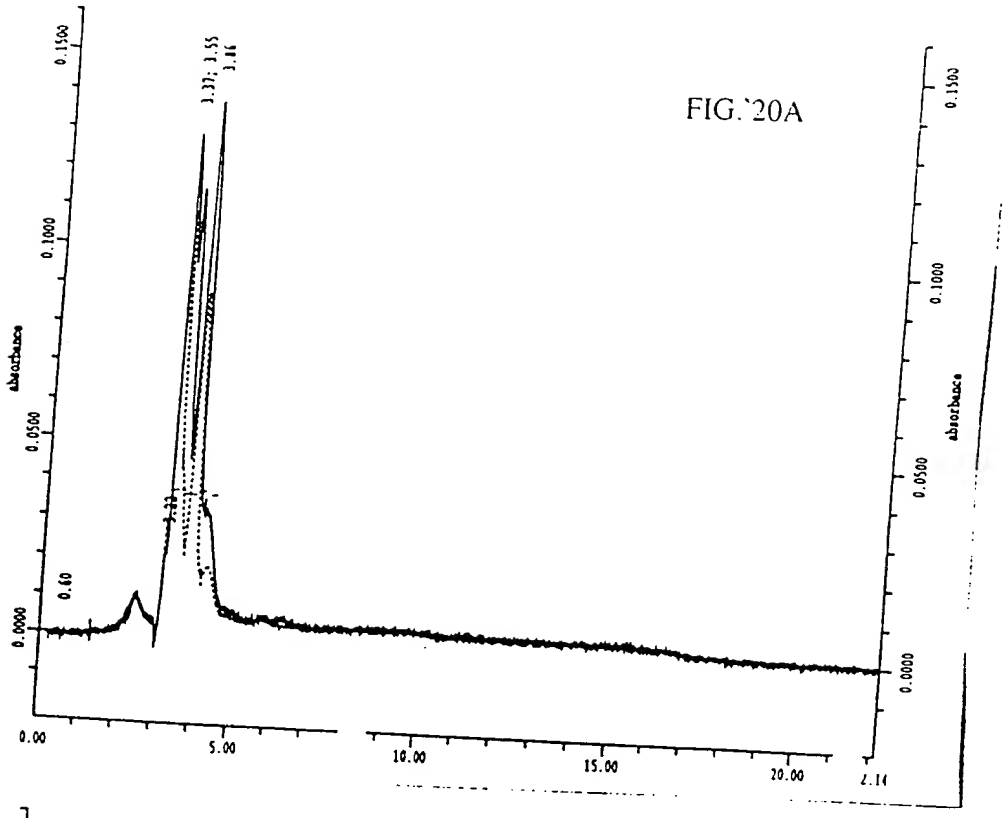


FIG. 20A

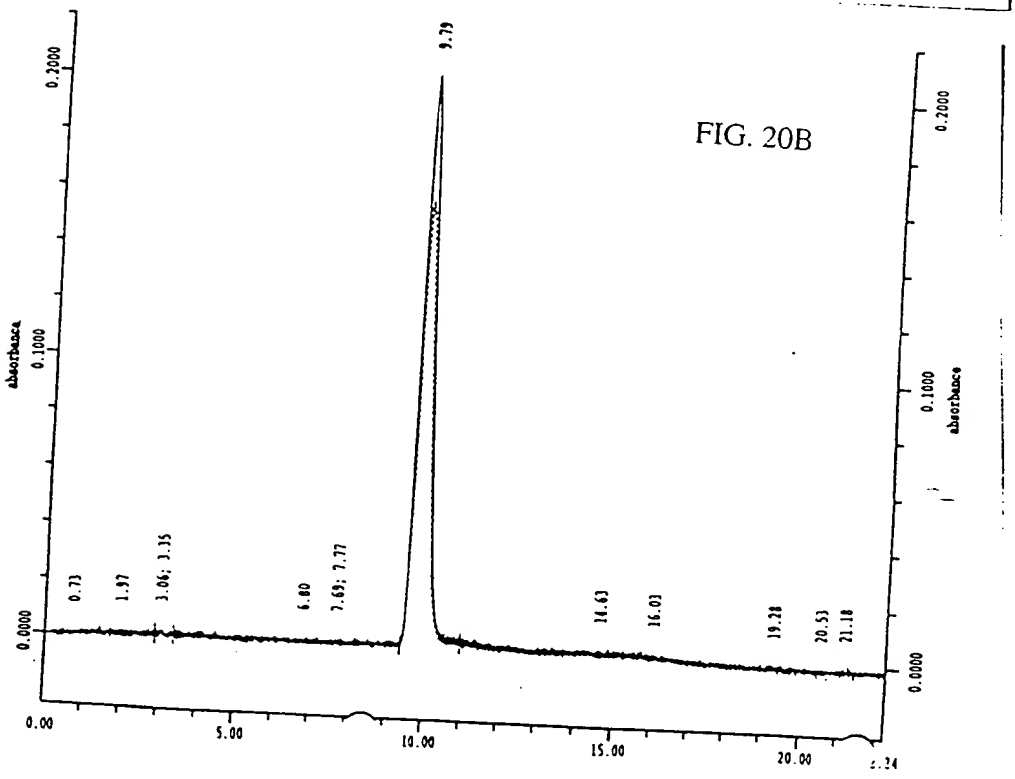


FIG. 20B

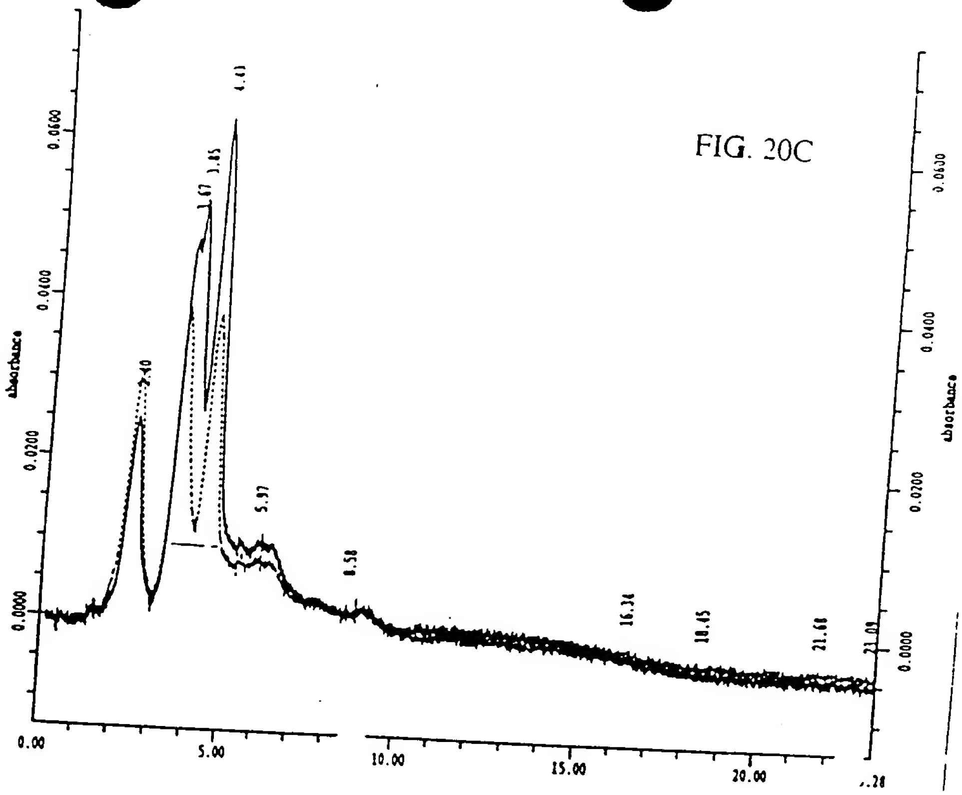


FIG. 20C

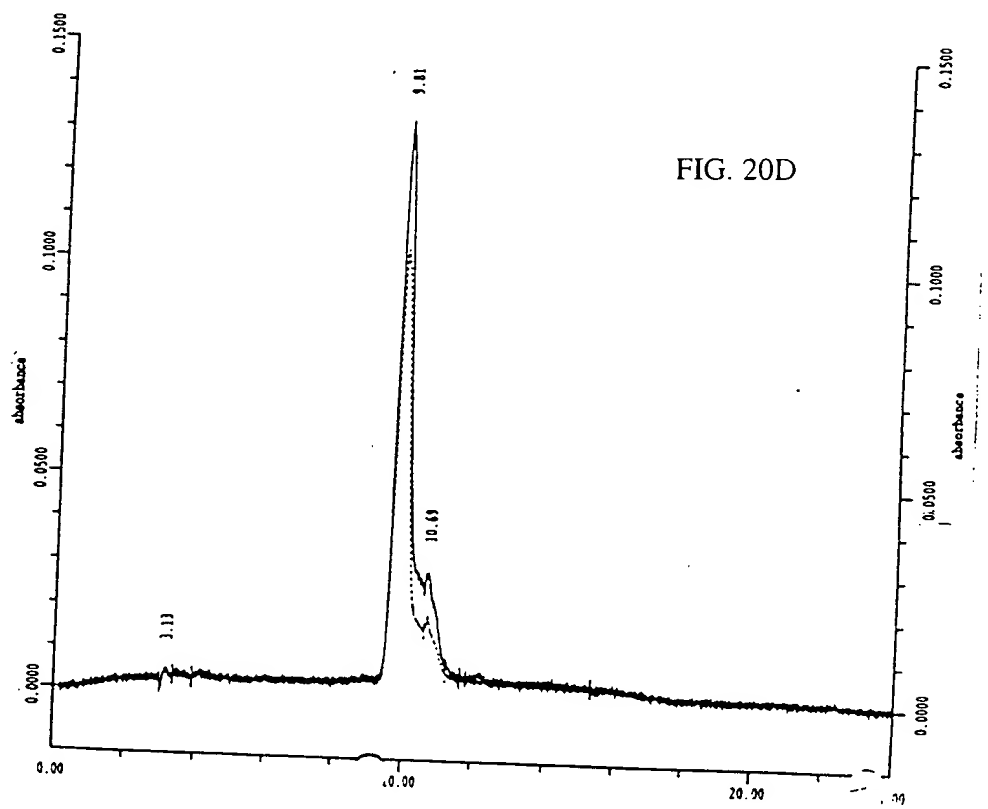


FIG. 20D

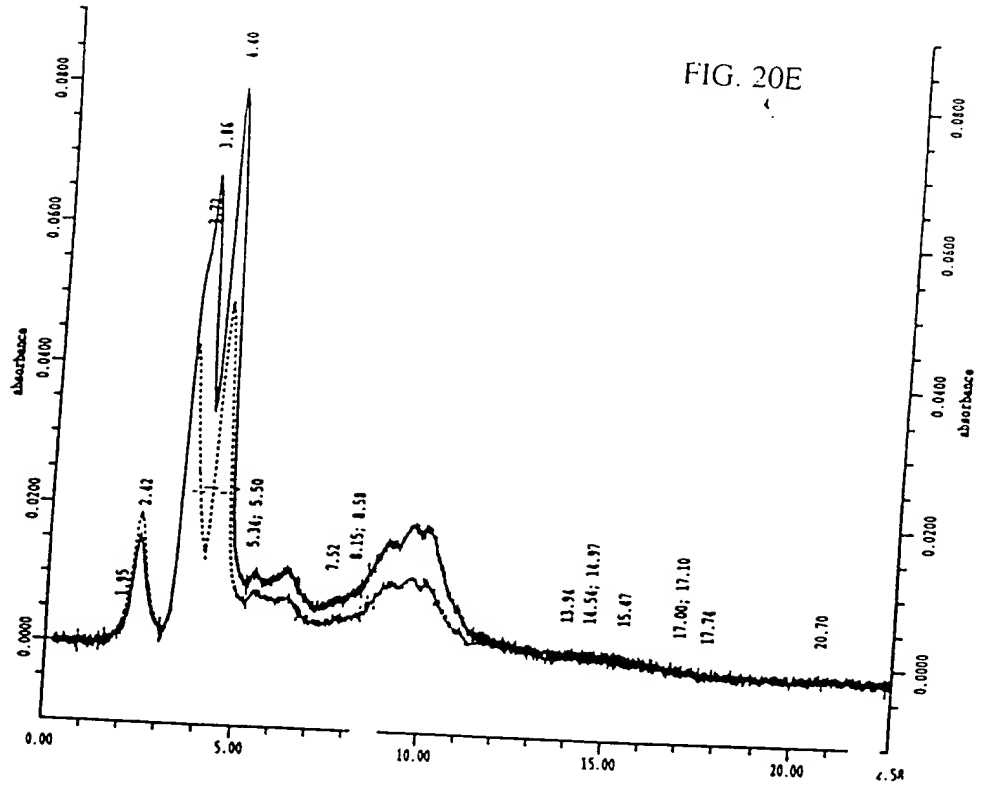


FIG. 20E

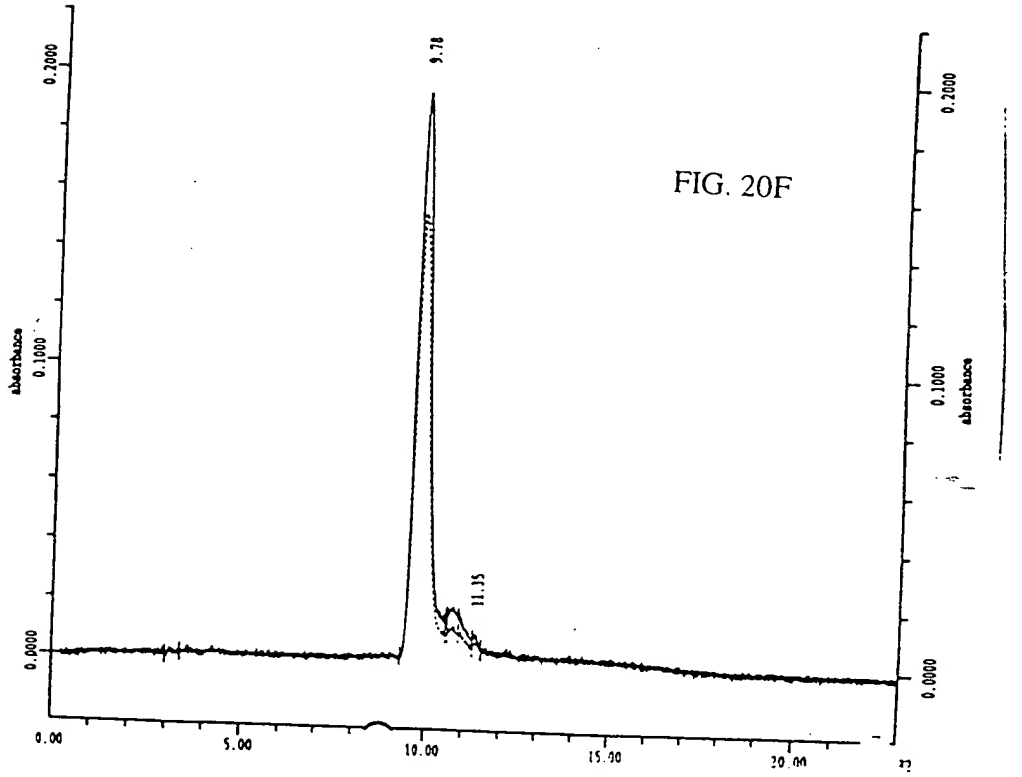


FIG. 20F

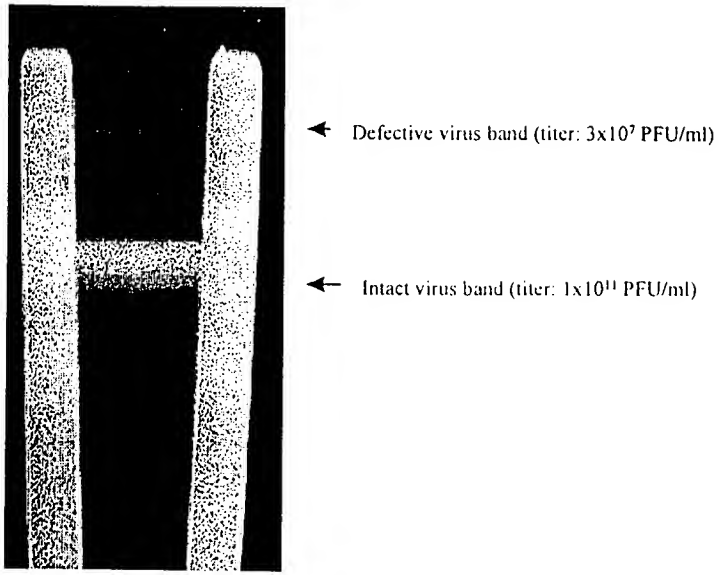

Defective virus band (titer: 3x10⁷ PFU/ml)
Intact virus band (titer: 1x10¹¹ PFU/ml)

FIG. 21

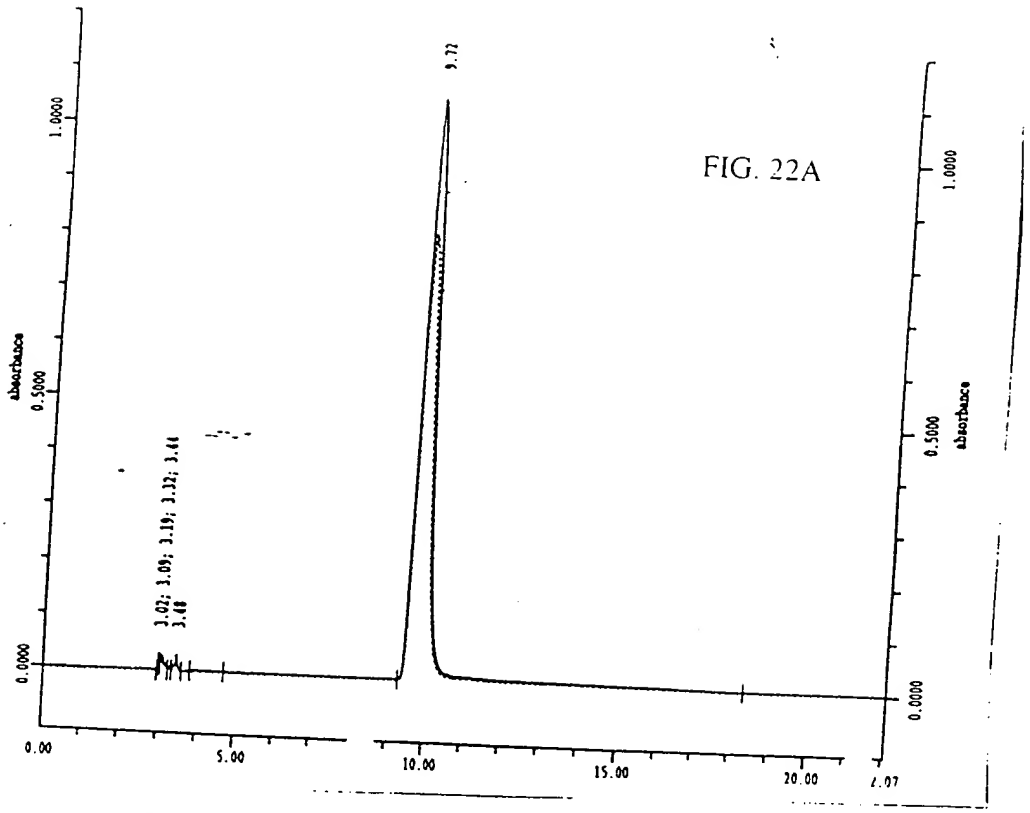


FIG. 22A

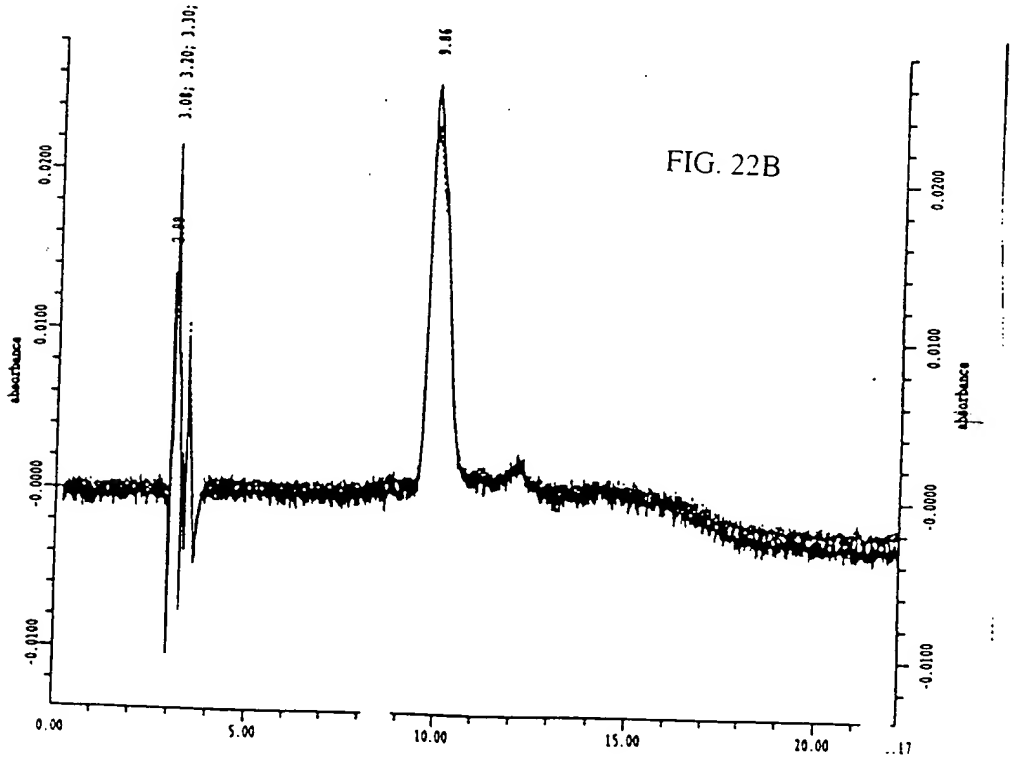


FIG. 22B

	Titer (PFU/ml)	Vol. (ml)	Yield (PFU)	Recovery (%)	
				Step	Acc.
Cube (low perfusion rate, keep glucose > 1g/L)					
↓ 1% Tween-20 in buffer A					
Harvest					
↓ Clarification and Filtration (0.22 um)					
Virus solution	$2.6x10^9$	1900	$4.9x10^{12}$		
↓ Conc./diaf. (10-fold conc., diaf. into 1M NaCl buffer A)					
Conc. sup	$2.5x10^{10}$	200	$5x10^{12}$	102%	
↓ Benzonase treatment (O/N, RT, 100u/ml)					
Treated sup					
↓ Dilute with water to conductivity = 22-25 mS/cm					
Diluted virus solution	$7x10^9$	700	$4.9x10^{12}$	98%	100%
↓					
Purified virus	$1.5x10^{10}$	240	$3.6x10^{12}$	73%	73%
↓ conc./diaf (5-fold conc.)					
Final purified product	**$7x10^{10}$**	**50**	**$3.5x10^{12}$**	**97%**	**71%**

FIG. 23

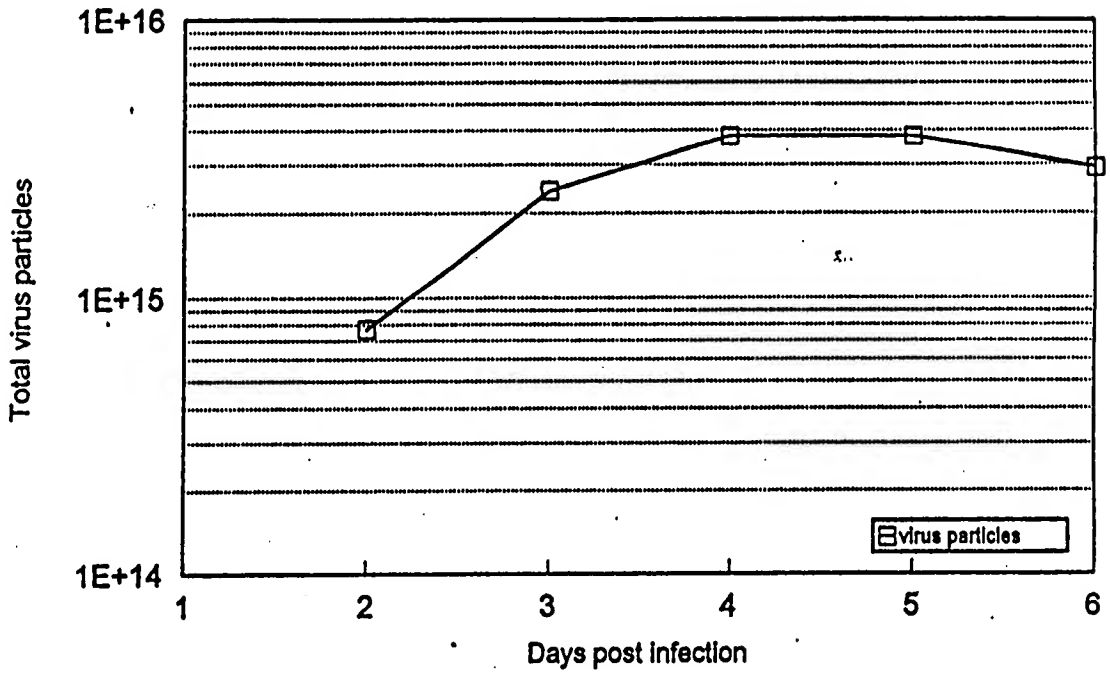

1E+16
1E+15
1E+14
Total virus particles
1
2
3
4
5
6
Days post infection
virus particles

FIG. 24

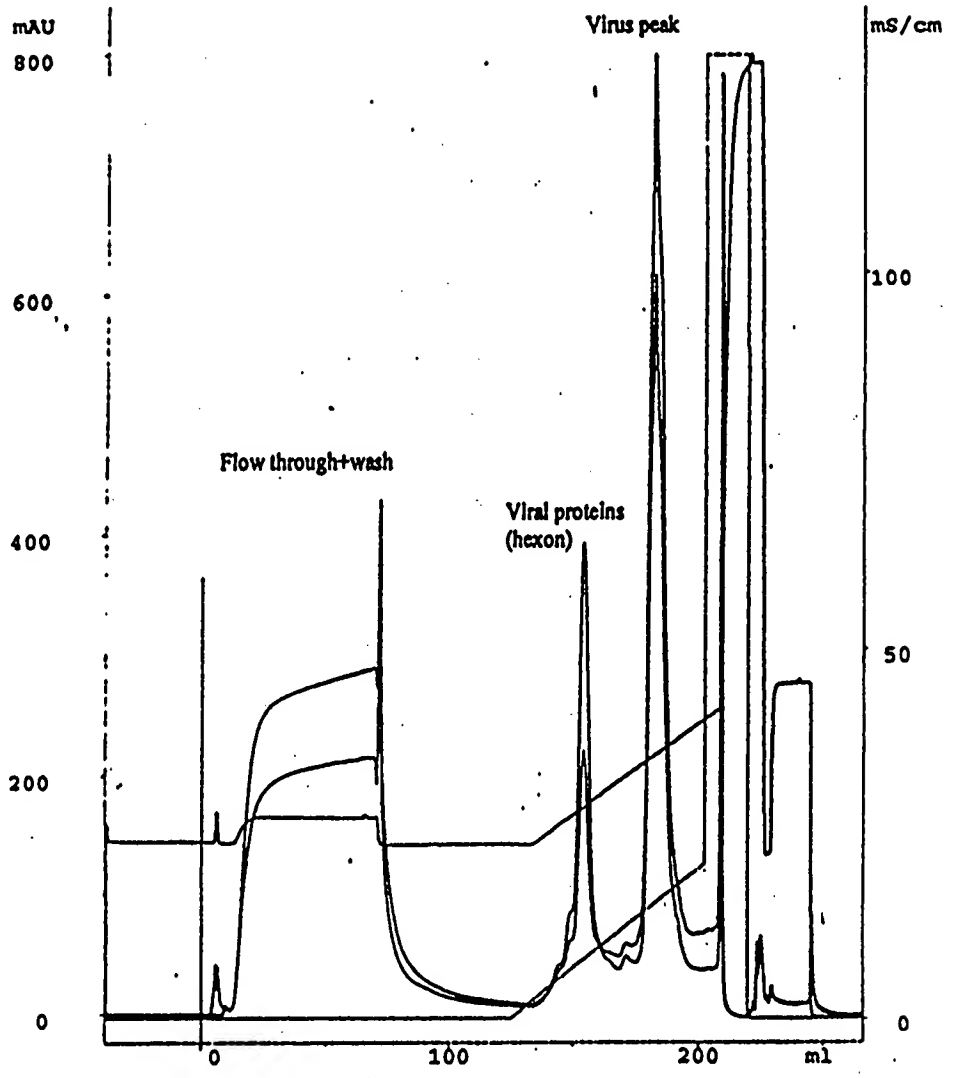

mAU
800
600
400
200
0
mS/cm
100
50
0
Virus peak
Flow through+wash
Viral proteins
(hexon)
0
100
200
ml

FIG. 25

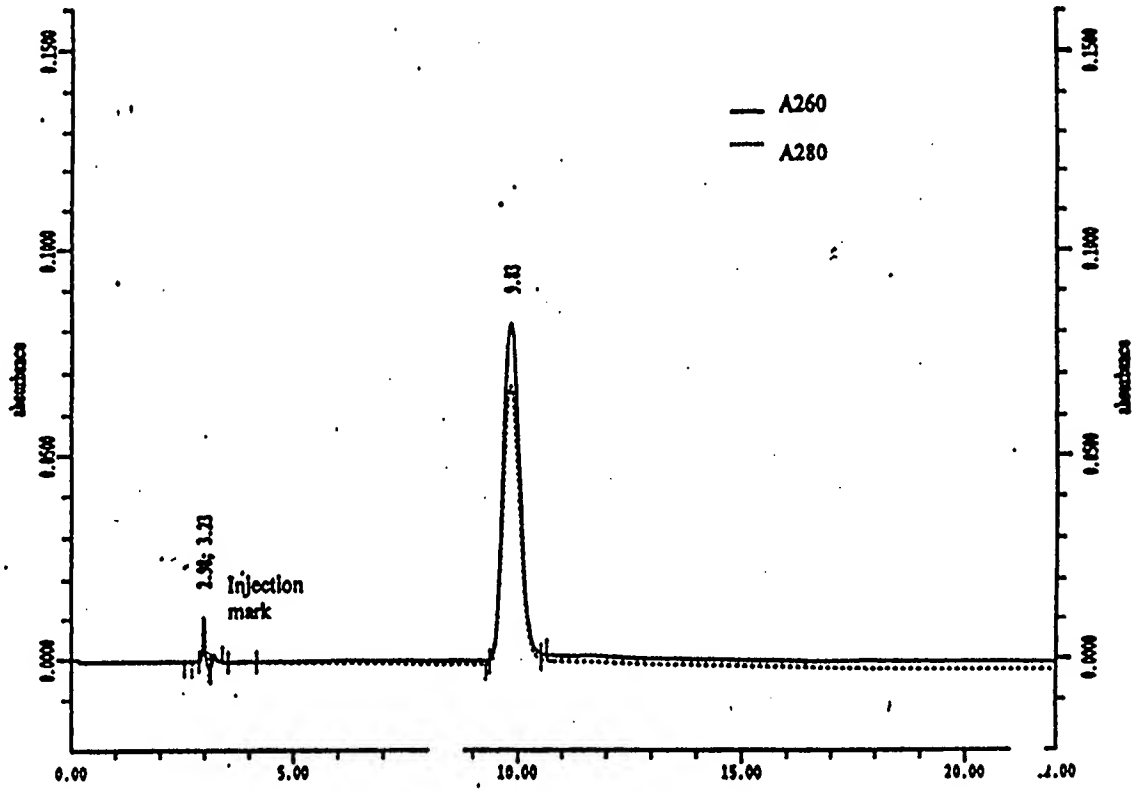
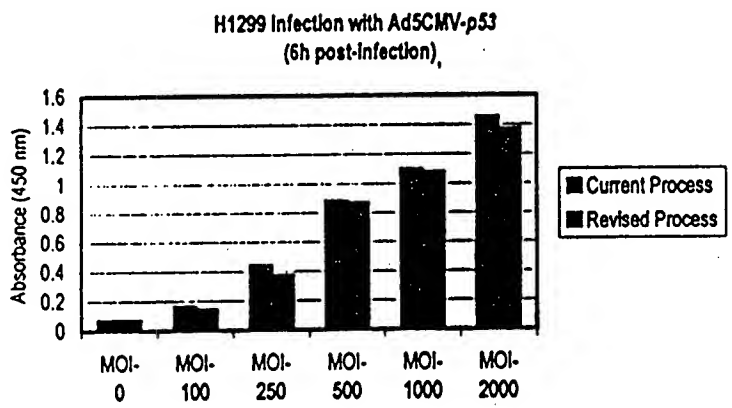

A260
A280
9.83
2.94; 3.23
Injection mark
0.1500
0.1000
0.0500
0.0000
Absorbance
0.00
5.00
10.00
15.00
20.00

FIG. 26


H1299 Infection with Ad5CMV-p53
(6h post-infection)
Absorbance (450 nm)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
MOI-0
MOI-100
MOI-250
MOI-500
MOI-1000
MOI-2000
Current Process
Revised Process

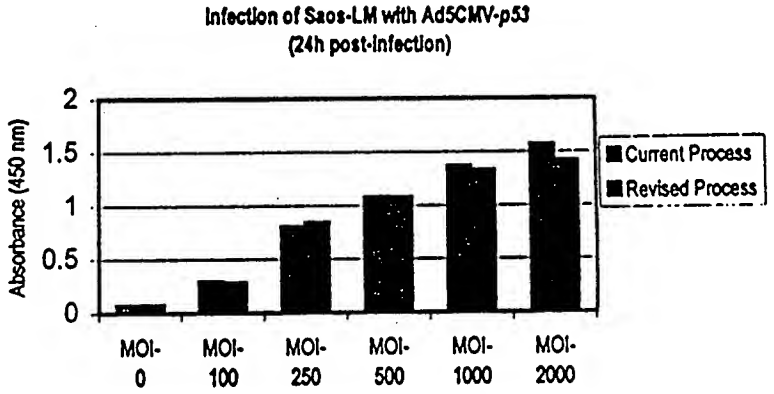

Infection of Saos-LM with Ad5CMV-p53
(24h post-infection)
Absorbance (450 nm)
2
1.5
1
0.5
0
MOI-0
MOI-100
MOI-250
MOI-500
MOI-1000
MOI-2000
Current Process
Revised Process

FIG. 27

The Revised Process (to be used in support of Clinical Study T203)

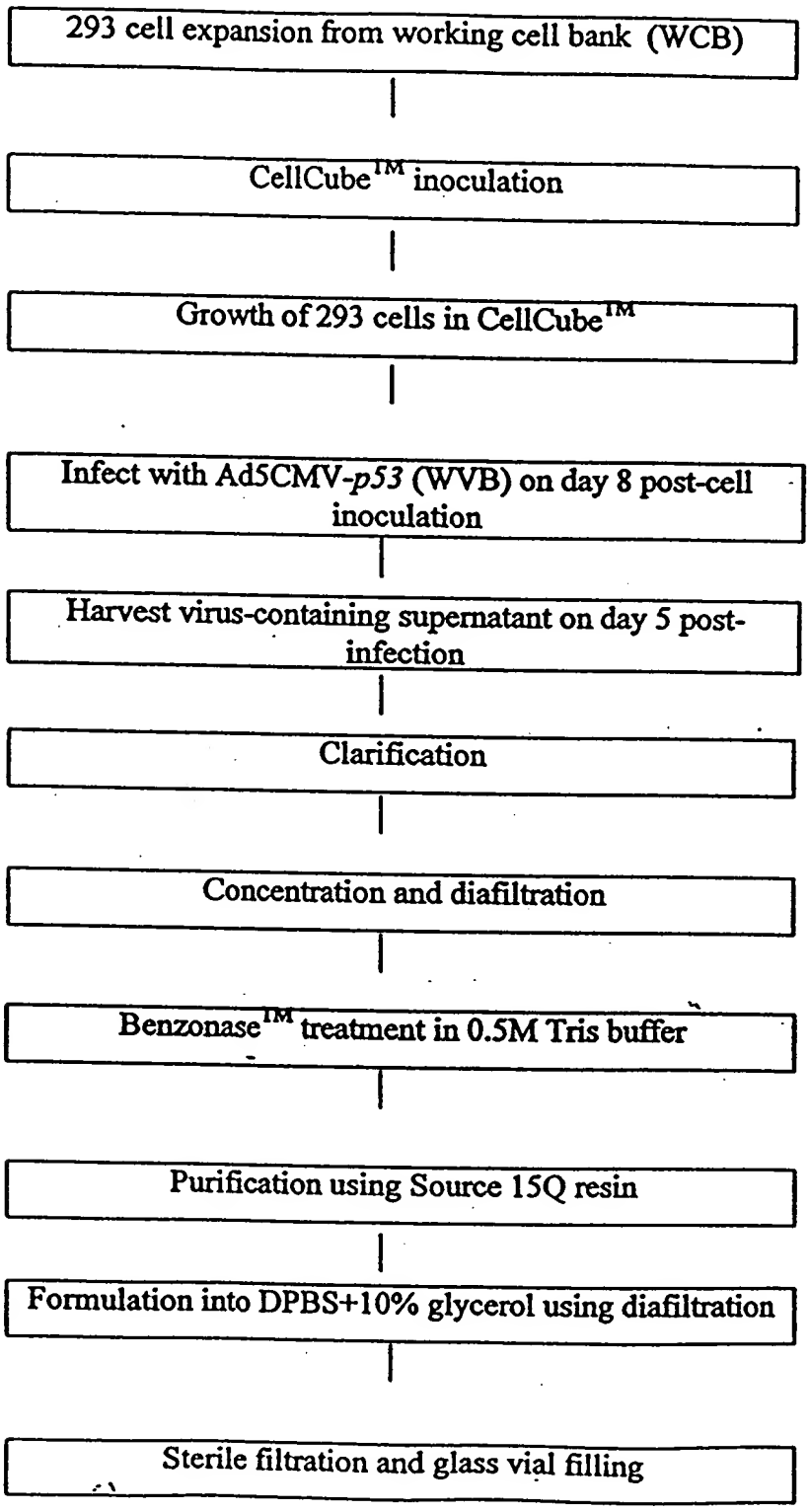
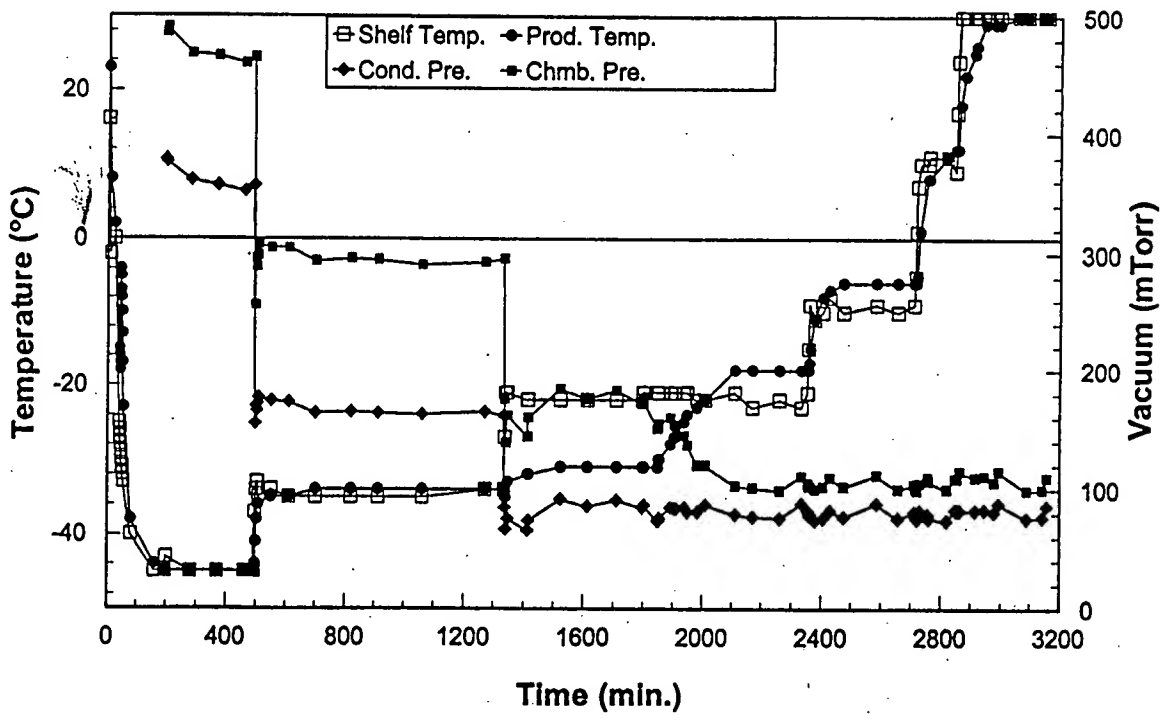


FIG. 28



Lyophilization Cycle

FIG. 29

Secondary drying at 10°C
Formulation set 10 (6-9) + Adp53 (run1)

Date (Temp.)	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)				Water Content (W%)			
	Set10-6	Set 10-7	Set 10-8	Set 10-9	Set10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9
4/11/97	5.5	6	5.8	6.5	24.5	24.6	24.9	26.7	2.2	2.5	2.7	3.3
5/15/97 (-20°C)	7.6	7.1	7.5	8.1	22.4	25.6	26.8	28.5	2.2	2.5	2.8	3.3
5/15/97 (4 °C)	6.5	6.3	6.5	10	22	23	24	27.5	2.4	2.6	3	3.4
5/15/96 (r.t.)	7.1	7.1	6.7	3.3	14.5	16.5	6.2	4.2	2.7	2.9	3.2	3.5
7/18/97(-20 °C)	6.8	6.4	6.8	7.2	28.7	28.9	28.6	31.2	2.3	2.5	2.8	3.3
7/18/97(4 °C)	6	5.8	7.3	9	25	26.6	27.6	31.1	2.5	2.8	3	3.6
7/18/97(r.t.)	1.2	0.8	4	1.4	0.9	1.8	0.7	0.7	2.7	2.9	3	3.4
10/22/97(-20 °C)	7.9	7.5	7.9	7.8	25.5	25	25.4	26.2	2.4	2.6	2.8	3.1
10/22/97(4 °C)	6.8	6.8	5.8	8	22	23	24.7	24.2	2.7	2.9	3.2	3.6
10/22/97(r.t.)	< 0.01	< 0.01	< 0.01	< 0.01	N.D.	N.D.	N.D.	N.D.	2.7	2.9	3.1	3.4
4/16/98(-20 °C)	6	5.8	7.1	7.2	19.3	20.3	23.5	26.1	2.4	2.6	3	3.4
4/16/98(4 °C)	5.4	7.2	6.1	6.3	21.7	22.8	22.9	24.6	2.9	3.1	3.3	3.8
4/16/98(r.t.)	0.0003	0.001	0.0007	0.001	N.D.	N.D.	N.D.	N.D.	2.7	2.9	3.1	3.4

N.D.: not detectable

CONTROLS

Date	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)			
	Set 10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9
4/11/97	5.5	7	7	7	35.5	35.8	36	36.9

Run 1: secondary drying at 10 °C
Formulation set 10: 6%-mannitol, 0.5% HSA, 1% glycerol and different percentages of sucrose in 10 mM-tris buffer (pH = 7.5, 1mM $MgCl_2$)

FIG. 30A

Formulation set 11 (6-9) + Adp53 (run1)

Date (Temp.)	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)				Water content (W%)			
	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9
5/2/97	7	6	6.3	5.8	28.5	28.8	28.4	29.5	2.3	2.7	3.5	4
6/20/97 (-20 °C)	6.2	6.6	6.9	6.5	26.3	25	27	27.3	2.2	2.8	3.4	4.6
6/20/97 (4 °C)	6.1	6	6.5	6.5	24.1	22.1	25.6	26.6	2.5	2.8	3.5	4.8
6/20/97(R.T.)	3.3	3	1	< 0.1	20.5	17.4	5.2	9.1	2.7	3.1	3.5	4.7
8/18/97(-20 °C)	8	7.2	7.5	7.6	21.6	21.8	25.3	24.9	2.3	2.8	3.7	4.9
8/18/97(4 °C)	8	7.3	8	8	22.7	22.7	24.9	25	2.6	3	3.9	4.2
8/18/97(R.T.)	< 0.1	< 0.1	< 0.1	< 0.1	N.D.	N.D.	0.2	13.1	2.7	3	3.5	4.4
10/22/97(-20 °C)	7.9	7.5	7.9	6.7	21	22	25.1	24	2.4	3	3.9	4.4
10/22/97(4 °C)	6	6.9	6.8	7.3	21.4	22	23.1	23.1	2.6	3	3.3	4.6
10/22/97(R.T.)	< 0.01	< 0.01	< 0.01	0.015	N.D.	N.D.	N.D.	9	2.7	2.9	3.9	5
5/8/98(-20 °C)	8.3	7.5	8	8.7	19	18.2	19.9	21.1	2.6	3.1	4	4.6
5/8/98(4 °C)	7	7.1	7.8	6.5	17.3	17.1	18.2	17.8	2.8	3.2	4.1	5.1
5/8/87(R.T.)	0.00033	0.000065	0.00045	0.000016	N.D.	N.D.	N.D.	N.D.	2.7	2.9	4	4.9

N.D.: not detectable

CONTROLS

Date	PFU x10^9/ml				HPLC viral particles)x10^{10}/ml)			
	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9
5/2/97	6.4	6.8	6.5	6.5	37.7	36.7	37.3	36

Run 1: secondary drying at 10 °C
Formulation set 11: 5%-mannitol, 0.5% HSA, 1%-glycerol and different percentages of sucrose in 10 mM-tris buffer (pH = 7.5, 1mM $MgCl_2$)

FIG. 30B

Secondary drying at 30°C without N_2 blanketing

Formulation set 10 (6-9) + Adp53 (run2)

Date (Temp.)	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)				Water content (W%)			
	Set 10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9
5/15/97	6.5	5.6	6.1	6	18	18.6	21.9	23.3	0.8	1.1	1.3	1.5
6/20/97(4 °C)	5.4	5.6	5.5	5.5	14.6	14.9	17.2	16.6	0.8	1.2	1.5	1.6
6/20/97(R.T.)	4.5	5	5.5	6	10.8	11.8	15	15.4	1.3	1.4	1.6	1.9
8/18/97(4 °C)	7	6.7	6.8	7	15.3	17.1	17.9	17.7	1.3	1.5	1.5	1.7
8/18/97(R.T.)	2.4	2.2	4.8	5.8	4.3	7.2	11.7	14.2	1.3	1.6	1.7	2.1
11/20/97(4 °C)	5.5	5.5	5.3	5.7	16.8	16.8	20.6	20.1	1.1	1.4	1.6	1.9
11/20/97(R.T.)	0.45	0.9	2.3	3.1	1.5	5.5	7.3	10.7	1.3	1.7	1.8	2.2
5/14/98(4 °C)	4.9	4.7	5.4	6.5	9.7	11.9	12.6	14.2	1.2	1.6	2.2	1.4
5/14/98(R.T.)	0.000006	0.00006	0.00004	0.000024	N.D.	N.D.	N.D.	N.D.	1.4	1.6	1.3	2

N.D.: not detectable

CONTROL

Date	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)			
	Set 10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9
5/15/97	7	5.6	7	7	31.2	30.6	31.6	31.4

Run 2: secondary drying at 30 °C
Formulation set 10: 6%-mannitol, 0.5% HSA, 1%-glycerol and different percentages of sucrose in 10 mM-tris buffer (pH = 7.5, 1mM $MgCl_2$)

FIG. 31A

Formulation set 11 (6-9) + Adp53 (run2)

Date (Temp.)	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)				Water content (W%)			
	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9
5/22/97	7.5	6.3	7.3	6.5	17.4	16.6	20.3	24.7	1	1.2	1.6	1.9
6/20/97 (4 °C)	5.5	6.3	6	7.5	14.8	16.1	17.5	21.1	1.2	1.3	1.7	1.8
6/20/97 (R.T.)	5	6	6	7.5	12.6	14.9	17.2	20.3	1.4	1.6	1.9	2
8/18/97(4 °C)	6.3	6.7	6.8	7.5	15.7	17.2	18.5	22.6	1.2	1.5	1.8	1.9
8/18/97(R.T.)	3.3	4.5	5.5	7	7.4	10.5	15.8	21.2	1.6	1.7	1.9	2.2
11/20/97(4 °C)	5.3	5.6	5.3	6.6	17.3	20	22.6	26.3	1.2	1.4	1.9	1.9
11/20/97(R.T.)	0.8	1.9	3	0.2	3.2	7.9	14.2	1.3	1.6	1.7	2	2.1
5/14/98(4 °C)	6.7	7.2	6.9	7.6	12.4	13.9	15.5	18.5	1.3	1.6	2	2.2
5/14/98(R.T.)	0.0013	0.00005	0.00031	0.00045	N.D.	N.D.	N.D.	N.D.	1.6	1.8	1.6	2

N.D.: not detectable

CONTROL

Date	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)			
	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9
5/22/97	8	7.4	8.3	7.6	26.7	27.6	27.5	32.4

Run 2: secondary drying at 30 °C
Formulation set 11: 5%-mannitol, 0.5% HSA, 1%-glycerol and different percentages of sucrose in 10 mM-tris buffer (pH = 7.5, 1mM $MgCl_2$)

FIG. 31 B

Secondary drying at 30°C with N_2 blanketing

Formulation set 10 (6-9) + Adp53 (run3)

Date (Temp.)	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)				Water content (W%)			
	Set 10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9
6/13/97	3.4	4.3	4.1	4.2	16	16.5	16.1	18.1	0.8	1.1	1.3	1.4
7/18/97 (4 °C)	6.3	6.3	6	6	17.9	19.5	19.9	20.6	0.9	1.2	1.4	1.6
7/18/97 (R.T.)	4.1	5.5	5	5.5	11.4	15.5	18.2	20.6	1.2	1.4	1.7	1.8
9/16/97 (4 °C)	4.2	5.5	4.5	5.1	15.3	16.1	16.4	17.8	1	1.3	1.5	1.7
9/16/97 (R.T.)	0.7	1.2	5	4	2.9	5	9.5	13	1.3	1.5	1.8	2
12/4/97 (4 °C)	5.5	5.3	5.4	5.9	16.1	16.2	18.1	18.5	1.1	1.4	1.6	1.7
12/4/97 (R.T.)	0.3	0.5	2.5	3.4	N.D.	1.7	4.7	8.8	1.4	1.6	1.8	2
6/29/98/(4 °C)	3.8	5.1	5.3	5.4	10.6	10.8	12	12.9	1.3	1.5	1.8	1.9
6/29/98(R.T.)	0.00003	0.00006	0.0001	0.0001	N.D.	N.D.	N.D.	N.D.	1.4	1.6	1.7	1.8

N.D.: not detectable

CONTROL

Date	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)			
	Set 10-6	Set 10-7	Set 10-8	Set 10-9	Set 10-6	Set 10-7	Set 10-8	Set 10-9
6/13/97	4.7	3.8	5.5	6.2	26	26.2	27.4	27.5

Run 3: secondary drying at 30 °C with N_2 gas back-fill

Formulation set 10: 6%-mannitol, 0.5% HSA, 1%-glycerol and different percentages of sucrose in 10 mM-tris buffer (pH = 7.5, 1mM $MgCl_2$)

FIG. 32A

Formulation set 11 (6-9) + Adp53 (run3)

Date (Temp.)	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)				Water content (W%)			
	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9
6/13/97	3.4	4.2	3.6	4.4	16.1	16.3	18.4	19.3	0.9	1.3	1.8	1.9
7/18/97 (4 °C)	5.5	6.2	6.5	6.2	18	19.5	23	23.9	1	1.4	1.8	2.1
7/18/97 (R.T.)	3.7	6	6.7	7.3	13.7	18.7	21.8	22.8	1.3	1.7	2	2.2
9/16/97 (4 °C)	3.9	4	4.6	6	15.6	17.3	19.5	20.6	1.3	1.5	1.9	2.1
9/16/97 (R.T.)	0.8	2.2	4	5.3	3.6	6.8	13.8	14.6	1.5	1.9	2.3	2.4
12/4/97(4 °C)	4.6	5.3	8	6.1	15.7	18.2	21.4	21.6	1.2	1.6	2.1	2.2
12/4/97 (R.T.)	0.4	0.6	0.3	< 0.01	N.D.	N.D.	1.7	N.D.	1.6	1.8	2.1	2.1
6/29/98(4 °C)	4.9	5	5.4	6.4	11.4	14.2	13.7	16	1.5	1.7	2.1	2.6
6/29/98(R.T.)	0.0001	0.00015	0.00085	0.0012	N.D.	N.D.	N.D.	N.D.	1.6	1.7	2.2	2.3

N.D.: not detectable

CONTROL

Date	PFU x10^9/ml				HPLC viral particles (x10^{10}/ml)			
	Set 11-6	Set 11-7	Set 11-8	Set 11-9	Set 11-6	Set 11-7	Set 11-8	Set 11-9
6/13/97	4.5	5	4	5	26.5	26.9	26.6	27.1

Run 3: secondary drying at 30 °C with N_2 gas back-fill

Formulation set 11: 5%-mannitol, 0.5% HSA, 1%-glycerol and different percentages of sucrose in 10 mM-tris buffer (pH = 7.5, 1mM $MgCl_2$)

FIG. 32B

AQUEOUS FORMULATION SET 1

Date (Storage Conds.)	PFU x10^9/ml				HPLC viral particles (x 10^{10}/ml)			
	10%-G	5%-S,5%-HSA	5%-S,%-PEG	5%-T,1%-PEG	10%-G	5%-S,5%-HSA	5%-S,1%-PEG	5%-T,1%-PEG
8/1/97	5.8	4.7	4.3	4.4	16.9	14.5	16.1	16.7
8/28/97(4°C, N_2)	5.8	5.8	6.4	6.3	13.3	14.9	13.8	13.4
8/28/97(4°C, Air)	5	5.9	6	5.9	12.9	14.2	12.9	12.9
8/28/97(R.T., N_2)	4.4	4.8	5	6	12.6	14.5	13.5	12.9
8/28/97(R.T., Air)	4.3	5	5	5.6	12.3	13.7	13	13
10/30/97(4°C, N_2)	3.8	4	4.7	3.8	14	15.5	14.7	14.8
10/30/97(4°C, Air)	3	4.1	3.7	4.7	12.6	14.9	14.3	14.4
10/30/97(R.T., N_2)	1.5	3.4	3.5	3.6	13.8	15.1	14.6	14.4
10/30/97(R.T., Air)	1.5	3.6	2.2	3.1	12.7	14.7	14.8	14.4
1/12/98(4°C, N_2)	3.2	4.1	3.3	3.4	7.3	11.1	9.5	9.5
1/12/98(4°C, Air)	1.5	3.8	3.9	3.4	7.7	10.8	10.2	10
1/12/98(R.T., N_2)	0.1	1.4	0.7	0.7	10	10.8	11.1	10.4
1/12/98(R.T., Air)	0.4	1.6	1	0.4	9.9	11	10	10.4
4/30/98(4°C, N_2)	0.08	4.3	4	5.3	5.1	12.3	12.3	12.1
4/30/98(4°C, Air)	1.5	3.6	4.4	4.5	5	11.6	11.8	11.9
4/30/98(R.T., N_2)	0.0025	0.23	0.11	0.17	11.1	12.3	12.6	12.5
4/30/98(R.T., Air)	0.0015	0.21	0.063	0.007	11	12.4	12.3	11

G: glycerol S: sucrose PEG: PEG-3500 T: trehalose
Glycerol is in PBS buffer (10%).
Other formulations are in 10 mM-tris buffer with 0.15 M-NaCl and 1 mM-$MgCl_2$ (pH = 8.2).

FIG. 33

Aqueous Formulation Set 2

Date (Temp.)	PFU x10^9/ml											
	AQF2-1	AQF2-2	AQF2-3	AQF2-4	AQF2-5	AQF2-6	AQF2-7	AQF2-8	AQF2-9	AQF2-10	AQF2-11	AQF2-12
9/25/97	2.8	2.8	2.8	3	2.8	2.8	2.7	2.8	2.7	3.3	3.1	2.7
11/05/97 (4 oC)	2.3	3.2	2.4	3.6	2.7	2	3.6	3.8	2.7	3	3.5	2.5
11/05//97 (R.T.)	2.2	0.1	2.4	2.7	2.1	2.1	3.2	2.1	3	3	3.4	2.9
12/12//97 (4 °C)	2.2	0.1	2.4	2.7	2.1	2.1	3.2	2.1	3	3	3.4	2.9
01/09/98 (r.t.)	1.2	<0.1	0.2	1.2	0.2	0.1	1.3	1.1	0.2	<0.1	2	1.1
3/27//98 (4 °C)	1.8	<0.1	1.9	2	<0.1	1.7	2	<0.1	2.6	2.9	2.6	1.8
3/27/98 (r.t.)	0.6	<0.1	<0.1	0.8	<0.1	<0.1	1	<0.1	<0.1	<0.1	1.1	0.7

Date (Temp.)	HPLC viral particles (x10^{10}/ml)											
	AQF2-1	AQF2-2	AQF2-3	AQF2-4	AQF2-5	AQF2-6	AQF2-7	AQF2-8	AQF2-9	AQF2-10	AQF2-11	AQF2-12
9/25/97	10.9	9.6	9.7	11.3	10.7	10.6	10.9	10.8	10.7	11.4	11.8	10.7
11/05/97 (4 °C)	7.9	7.6	8.7	8.8	8.9	7.5	8.6	9.1	9.2	10.3	11.2	9.6
11/05/97 (r.t.)	8.2	6.6	7.6	8.6	7.7	9.3	9	8	9.3	10.3	11.1	9.6
12/12/97 (4 °C)	6.7	1.5	8	6.9	5.2	7.5	7.5	6.1	7.6	8.8	7.3	7.7
12/17/97 (r.t.)	7	1.2	7	7.5	4.1	7.1	7	3	8.2	7.6	8.4	7.5
3/13//98 (4 °C)	5.6	N.D.	6.2	6.7	N.D.	6.5	6.8	N.D.	7.1	8	8.9	7.2
3/13/98 (r.t.)	6.2	N.D.	6.5	6.9	N.D.	7.3	6.8	N.D.	6.9	7.8	7.5	7.1

Aqueous Formulation Set 2

Excipients	AQF2-1	AQF2-2	AQF2-3	AQF2-4	AQF2-5	AQF2-6	AQF2-7	AQF2-8	AQF2-9	AQF2-10	AQF2-11	AQF2-12
mannitol (W%)	5	5	5				5	5	5	5	5	
sucrose (W%)				5	5	5	5	5	5	5	5	10
glycine (M)	0.25			0.25			0.25				0.25	0.25
arginine (M)		0.25			0.25			0.25			0.25	
urea (W%)			1			1			1		1	
peg (W%)										1	1	

Excipients are in 10 mM-tris buffer (pH = 8.2) which consists of 0.5% glycerol, 0.15 M-NaCl and 1mM $MgCl_2$.

The formulations are stored at 4 °C and room temperature under nitrogen.

FIG. 34

Aqueous Formulation Set 3

Date (temp.)	PFU x 10^9				HPLC viral particles (x 10^{10}/ml)			
	F10-7	F10-8	F11-7	F11-8	F10-7	F10-8	F11-7	F11-8
10/3/97	2.2	3.3	2.1	2.8	12.1	12	11.8	12
11/6/97(-20 °C)	3.4	4	2.8	3.4	10.6	10.5	10.1	10.3
11/6/97(4°C)	3.5	3.6	4.3	2.8	10	9.7	9.9	10.3
1/15/98(-20 °C)	3.8	4.8	3.2	3.7	7.3	7.4	7.7	8
1/15/98(4 °C)	3.5	3.1	2.9	3.1	7.5	7.4	7.6	7.5

Excipients	F10-7	F10-8	F11-7	F11-8
mannitol(W%)	6	6	5	5
sucrose(W%)	7	8	7	8
HSA(W%)	0.5	0.5	0.5	0.5
glycerol(W%)	1	1	1	1
$MgCl_2$(mM)	1	1	1	1

FIG. 35

Aqueous formulation set

Date(temp.)	PFU x 10^9						
	AQF4-1	AQF4-2	AQF4-3	AQF4-4	AQF4-5	AQF4-6	AQF4-7
1/13/98	3	2.5	3.6	3.4	2.7	3.1	3.4
2/11/98 (4 °C)	2.5	3.2	3.3	2.9	2.6	2.9	2.6
2/11/98 (R.T.)	1.8	2.7	1.6	3.6	2.6	1.6	1.7
4/10/98 (4 °C)	2.2	2	2.6	3	2.4	1.9	2.2
4/10/98 (R.T.)	0.4	0.4	0.3	0.5	0.4	<0.1	1.1
7/24/98 (4 °C)	2.4	2.8	2.6	3.5	1.9	2.2	2.6
7/24/98 (R.T.)	0.002	0.005	0.006	0.005	0.005	0.005	0.001

Date(temp.)	HPLC Integrated Area						
	AQF4-1	AQF4-2	AQF4-3	AQF4-4	AQF4-5	AQF4-6	AQF4-7
1/13/98	8.7	10.9	11.5	11.1	9.5	9.7	11.3
2/16/98 (4 °C)	9.1	9.3	9.2	9.5	8.2	8.4	9.6
2/16/98 (R.T.)	6.8	9	9.5	9	8.7	8.4	9.3
4/10/98 (4 °C)	7.1	9.2	9.6	9.6	8.9	9.1	9.9
4/10/98 (R.T.)	7.5	9.5	10.1	9.7	8.9	8.9	9.5
7/24/98 (4 °C)	8.1	9.9	11.1	10.3	9.2	7.4	9.3
7/24/98 (R.T.)	7.3	3	10.7	8.9	10.4	10.45	3.5

Aqueous Formulation Set 4

Excipients	AQF4-1	AQF4-2	AQF4-3	AQF4-4	AQF4-5	AQF4-6	AQF4-7
mannitol(W%)	5	5	5	5	5	5	5
sucrose (W%)	5	5	5	5	5	5	5
Tween 80 (W%)		0.02	0.1	0.5			
Chap (W%)					0.02	0.1	0.5

Excipients are in 10 mM-tris buffer (pH = 8.2) which consists of 1% glycerol, 0.15 M-NaCl and 1 mM $MgCl_2$.
The formulations with virus are stored at 4 °C and room temperature under nitrogen.

FIG. 36